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ABSTRACT

This comparative study of technical and vocational education policy, planning, and administration in 16 countries is based on case studies prepared by representatives of those countries in 1982 according to guidelines drawn up in conformity with the activities foreseen in the Unesco Programme for 1981-83. Chapter 1 introduces the study. Chapter 2 presents the 16 countries in terms of the structures now in place for policymaking and planning in technical and vocational education, along with those for coordinating with manpower and development planning and with training systems outside the formal education system. Where appropriate, the structural analysis also deals with the framework for research, evaluation, and feedback in the system. Chapter 3 looks more closely into the policymaking and planning processes of the countries. Chapter 4 presents examples of the administrative process and related problems in certain selected countries, with particular attention to the management principles and methods applied. In chapter 5 the problems of financing and cost efficiency are addressed. Chapter 6 looks to future trends and development problems as they arise out of the material presented, and chapter 7 deals with what is being done and what could be done through international cooperation to strengthen policy, planning, and management in technical and vocational education. Following a brief concluding chapter, four appendixes provide the text of the Revised Recommendations concerning Technical and Vocational education; the technical and vocational education systems in diagram form; the guidelines for the original country reports; and a list of the authors of the reports. (YLB)

# Policy, planning and management in technical and vocational education

## A comparative study

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# Preface

This study is the third title in the series 'Trends and Issues in Technical and Vocational Education'. The series is addressed to teacher-educators, administrators, planners and all those interested in the current and possible future status of technical and vocational education on an international scale. The long-term objective is to promote the implementation of Unesco's Revised Recommendation concerning Technical and Vocational Education, which was adopted by the General Conference at its eighteenth session in 1974.

The present comparative study had its origin in case-studies prepared by sixteen countries in accordance with the activities foreseen in paragraph 1357 of Unesco's Approved Programme and Budget for 1981–83 (document 21C/5 Approved). The studies were also used as background and information papers for an international experts meeting held at Unesco Headquarters, Paris, in June 1982. This meeting concentrated on the policy, planning and administrative aspects of technical and vocational education. It was felt that these three areas deserved greater emphasis and that Unesco would therefore render a service to its Member States by publishing relevant information taken from these studies in the form of a condensed comparative study.

We wish to express our appreciation to all those who prepared these studies along given guidelines, thus greatly facilitating the comparative analysis. We also wish to thank Dr Mary Ann Calkins Pilain, Unesco consultant, who compiled the study.

The views expressed in this book are those of the individuals concerned and do not necessarily reflect those of Unesco. The designations employed and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the Unesco Secretariat concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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# 1 Introduction

It has now been nearly a decade since the Member States of Unesco adopted the Revised Recommendation concerning Technical and Vocational Education in 1974. This document, as it was intended to be, was both a summation of thinking at that time and a forward-looking philosophy and guide for the future. It has proved and is still proving its worth as a guide to the development of technical and vocational education despite the many and profound changes that have occurred, both for better and for worse, in approaches to, and implementation of, education, and in the social and economic structures and circumstances to which education must respond. In fact, the Recommendation is more timely than ever, particularly with regard to policy goals, planning approaches and management systems.

Glancing very briefly at the world as it was in 1974 and comparing it with the world as it is today, this timeliness becomes immediately obvious. It still seemed then that with good principles, goodwill, exchange of experience and information, and mutual financial aid, education everywhere could become more democratic, offering better opportunities to all in terms of personality development and career openings and would be an active agent in the development process. Ten years ago it seemed that the economic resources were available to expand technical and vocational education in the interests of economic development, democratization of education and society, and adjustments between education and the employment market.

As it has turned out, the situation is not as simple as all that. The world economy has slumped into recession. The energy crisis is with us and looks as if it will remain a constant factor in one form or another. Wildly fluctuating exchange rates have contributed to a lack of stability in the world economy. These circumstances have affected virtually all countries. Translated into human terms, all these factors have combined to produce a continuing unemployment and underemployment situation in developing countries and the worst employment crisis many industrialized nations have suffered since the Great Depression of the 1930s. Hence, massive unemployment is no longer

the lot of the developing countries alone. The unemployment problem in many industrialized and developing nations, as a result of the economic situation combined with profound changes in the employment structure consequent upon technological change, has taken on huge dimensions. This means that countries are obliged to come to grips with the problem of how to prepare young people for employment and how to offer adult workers the means to adapt to structural or technological change and to advance in their careers.

In these circumstances, technical and vocational education could not have higher priority on the current agenda.

Over the last decade, many countries have undertaken reforms of their educational systems. Looking at the reports from those countries on whose experience the present study is based, the record is quite impressive: as will be seen in the following pages, in the late 1970s most countries instituted new legislation and embarked on wide-ranging structural changes in their educational systems to give a larger place to technical and vocational education and training at all levels. These reforms are designed not only to meet development or manpower needs, but also to democratize education in such a way as to broaden opportunities for all to develop their capacities to the full, both in individual terms and in terms of their role in society and the working world.

In all of the reforms, a major consensus on policy objectives in technical and vocational education may be detected, thanks in large part, it may be felt, to the Recommendation. The objectives naturally and rightly vary considerably in detail, depending on the traditions and social, political and economic structures of the individual countries as well as on their level of development. It may be fairly said that the international community has in broad terms reached a consensus as to the role and aims of technical and vocational education. The fact that the possibility of drafting a Convention on Technical and Vocational Education for submission to Member States is being studied by Unesco is a reflection of this consensus.

The problem facing technical and vocational education today is not one of basic principles guiding policy. These are for the most part agreed upon both internationally and on a national basis. The crux of the current problem in terms of policy is rather what specific policy objectives should be set so as to improve the situation in a given country and how to set these objectives. The most important issue is to define realistic objectives and then implement them. This implementation in the first instance involves creating the necessary structures for planning and managing technical and vocational education with feedback into the policy-making process. But structures, which can be nicely designed on paper, cannot do the job alone. Something has to be done to ensure that they function. And so the present study is ad-

dressed to basic questions of mechanics and production. A machine may be beautifully designed, but unless there is an energy input to drive it, it is useless. Again, it may be beautifully designed and moreover produce, but if the output is useless then it is simply a technological anomaly. If it is designed for one purpose only and this purpose becomes obsolete, then the machine becomes obsolete. In the present instance, the energy input is human talent, ingenuity and drive, and the output is, or should be, human capacities, capabilities and fulfilled aspirations. The research and development involved are by no means easy.

This study will look at some of the machinery for formulating and implementing technical and vocational educational policy. It will focus on the planning process, the lines of co-ordination between education and employment, management of technical and vocational education systems, including deployment of resources, and the means of policy and planning adjustments as a result of evaluation and feedback.

The study has a very specific background: its origin was the International Experts Meeting on Policy, Planning and Administration of Technical and Vocational Education held by Unesco in Paris from 7 to 11 June 1982. Participants were invited to exchange views in an individual capacity and make recommendations for future Unesco activities. The meeting brought together representatives from twenty-one countries—Algeria, Australia, Bangladesh, Brazil, Bulgaria, United Republic of Cameroon, Cuba, France, German Democratic Republic, Federal Republic of Germany, India, Jamaica, Jordan, Mozambique, Nigeria, Peru, Sudan, United Republic of Tanzania, USSR, United States and Socialist Republic of Viet Nam—as well as observers from other international organizations, such as the International Labour Organisation (ILO) and the World Health Organization (WHO), and a non-governmental organization: the International Association of Educational and Vocational Guidance.

The meeting's deliberations were based on a general discussion paper prepared by the Unesco secretariat and three analytic working papers prepared by international experts in the field: K. Gopalan, 'Management and Administration of Technical and Vocational Education at Secondary and Post-Secondary Levels in its International Context'; W. Purgand, 'Policy and Planning in Technical and Vocational Education'; and W. W. Stevenson, 'The Role of Economic Analysis in Vocational Education Planning'. The meeting furthermore had available to it thirteen country studies prepared according to the guidelines set out in Appendix III. The countries concerned were: Algeria, Argentina, Australia, Chile, Czechoslovakia, Ecuador, Gambia, Ghana, Ireland, Lesotho, Netherlands, Sudan and Turkey.

The meeting made it possible to collect a wealth of information provided by these studies, along with the stimulating analyses of the policy and planning processes, educational management techniques as applied to technical and vocational education, and cost effectiveness submitted by the three international experts. Other country studies along the same lines have since become available from India, Sri Lanka and Indonesia. These have also been used in the present study.

This book was designed with a fivefold objective in view. In the first instance it is intended to make the information gathered as a result of the meeting available to a wider audience in accordance with a major Unesco objective and with one of the express recommendations of the meeting that 'the systematic exchange of information, ideas and experiences in the field of technical and vocational education is of great importance and should be further expanded'. Secondly, the book is designed to provide a comparative study of technical and vocational education policy, planning and administration in sixteen countries on the basis of material that is especially rich and up to date and which represents countries of all regions and at all levels of development. In the third place the study aims to offer a view of the current state of policy, planning and administration in technical and vocational education and to discern trends on the basis of this comparison. The fourth objective is to analyse the problems involved, with particular attention to development problems. Lastly, consideration is given to the question of what might be done through international co-operation to help solve these problems.

The concrete experience of the sixteen countries involved is the very foundation of the study. The second chapter therefore presents those countries in terms of the structures now in place for policy-making and planning in technical and vocational education along with those for co-ordinating with manpower and development planning and with training systems outside the formal education system. Where appropriate, the structural analysis also deals with the framework for research, evaluation and feedback in the system. This analysis is presented in diagrammatic form to facilitate comparison, and the accompanying commentary draws attention to salient features that do not necessarily stand out in a flow chart. In order to grasp the context of this organization 'at the top', the reader may wish to refer to Appendix II, which presents, again in diagram form, the overall educational system of each country studied, and the place of technical and vocational education within those systems. For purposes of further comparison, the reader may also wish to refer to an earlier Unesco study in this same series, *Developments in Technical and Vocational Education: a Comparative Study* (1978). Although this earlier study deals with the technical and vocational education systems in general, the educational systems and the policy, planning and administrative

structures of the twenty-one countries involved in the study are presented in the same form as will be found in these pages, while the guidelines for preparing the country studies were very similar indeed. The chapter in this earlier study entitled 'Policy, Planning and Administration' may then be taken as a companion to the present study and as a justification for its focus.

The third chapter of the present study looks more closely into the policy-making and planning processes of the countries concerned. This is followed by a presentation of the administrative process, with particular attention to the management principles and methods applied. The study then turns, in the fifth chapter, to the problem of financing and cost efficiency, the solid rock against which many a wave of ideals, good intentions and innovation has broken. Following this the study looks to future trends and development problems as they arise out of the material presented, and then deals with what is being done and what could be done through international co-operation to strengthen policy, planning and management in technical and vocational education so as to achieve the objectives for which all are striving.

# 2 National frameworks for policy, planning and administration

Sound structures, properly co-ordinated, are of fundamental importance if appropriate policies for technical and vocational education are to be set and, above all, implemented through sound planning and management. Repetition of the word 'sound' is intentional but perhaps calls for some explanation. The soundness of a structure is relative, although some basic engineering and architectural principles are universal, from the pyramids to modern skyscrapers. The foundations must be solid, the various parts coherent, the structure must serve its purpose and it must serve the values of the society for which it was intended and by which it was built. Otherwise it will either fall apart or be abandoned. In the following pages we will see structures that have been in place for thirty, forty or fifty years, and others that have not yet seen their tenth, or even their second, birthday. The only criteria for judgement are: do they or will they work, do they or will they hold up for this particular country and society.

The diagrams of the structures in place for policy-making, planning and administration in technical and vocational education that appear on the following pages are the basis for the rest of the study. These structures vary greatly in type and complexity from country to country, depending on the levels of development, the size of the country, whether its general governmental structure is centralized or follows a federal pattern, and the historical development of its educational system. The material provided and diagrams presented by some of the countries concerned in this study were highly detailed: these have been simplified to bring out the salient features of the system. Other presentations were very succinct and where possible these have been expanded on the basis of information provided elsewhere in the particular country study concerned. In other words, the following schematic representation already represents an analysis of the situation.

Several points should be borne in mind. Structural diagrams can indicate levels of hierarchy, show certain relationships of function or show where a function is not provided. They cannot show scale nor

indicate how or whether the structures function. Some systems do not easily admit of diagramming or can be slightly distorted by such an approach because of the plethora of private or public agencies and community groups involved in the policy-making and planning process with no hierarchical relation to one another. Although these systems may not seem ideal on paper, they may nevertheless work very well indeed.

# Key to Figures 1 to 16

Responsibility for general administration and institutional management of technical and vocational education

Planning and policy-making function

Co-ordination function with manpower planning and employment

Research and evaluation function

Supervisory function

# Algeria

FIG. 1.

FIG. 1. Algeria is in the process of reorganizing its whole approach to technical and vocational education within the framework of the current five-year plan so that not all the policy-making and administrative structures required are as yet in place. Since 1972, the thrust of policy has been to create a common system of basic education consisting of nine years' compulsory schooling for all. In the course of these reforms, vocational schools training qualified workers at secondary level were done away with and schools for technician education created at the upper secondary level. In fact this programme has been little implemented, and accordingly the Secretariat of State for Secondary and Technical Education was recently created to strengthen technical education and training at secondary and post-secondary levels. This unit will work closely with other ministries interested in technical and vocational education, either because they engage in it directly through their own institutes of technology or because they hire graduates. The secretariat will also work closely with industry in organizing the practical training required if young people are to achieve qualifications that have validity in the work place. The body primarily responsible for co-ordinating all these efforts is the Ministry of Planning and National Development, which also has major responsibility for allocating investments.

# Argentina

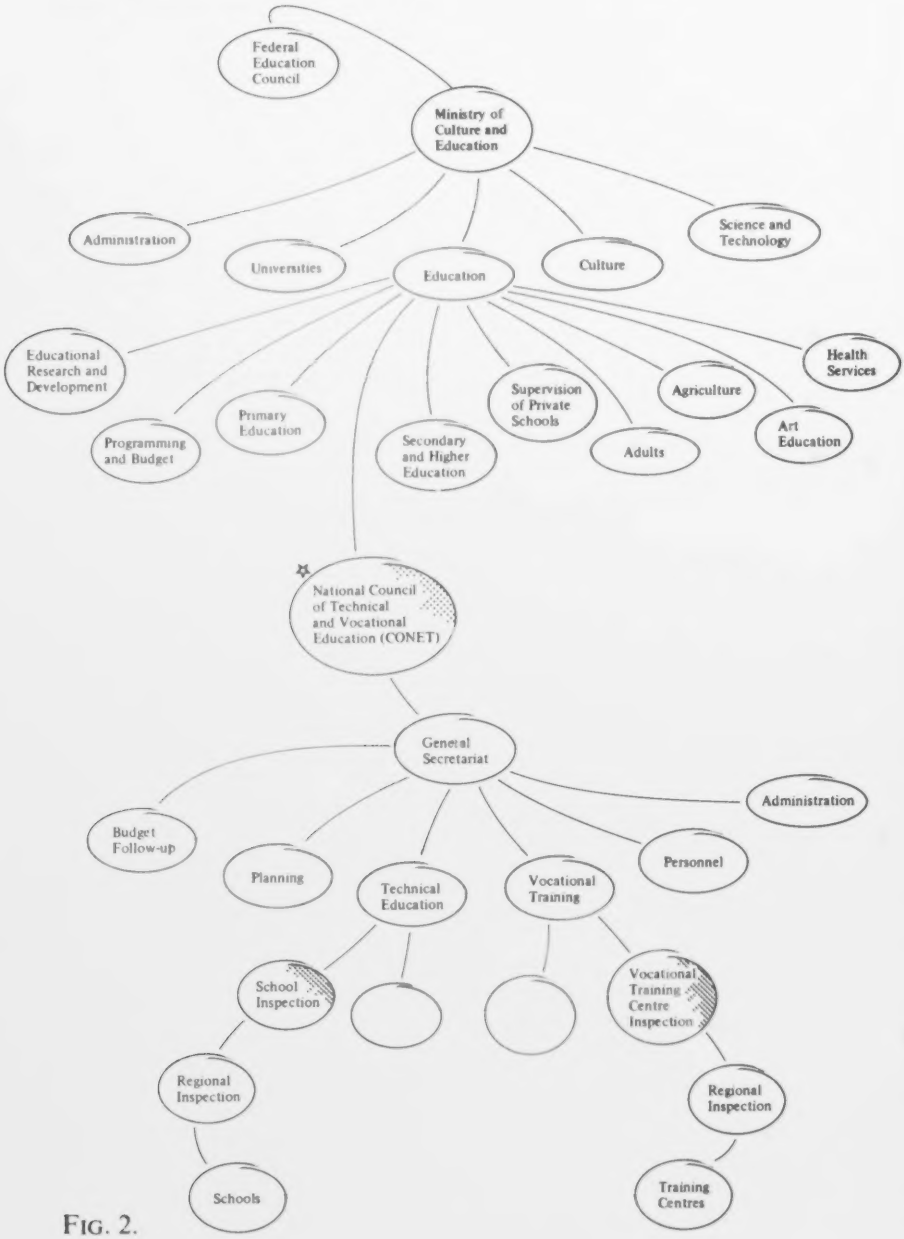


FIG. 2.

FIG. 2. As may be seen from the preceding diagram, in Argentina a special body responsible for technical and vocational education, the National Council of Technical and Vocational Education (CONET), is integrated into the organizational structure of the Ministry of Education and Culture. Originally constituted in 1959 to oversee technical education within the school system, the authority and functions of this body were considerably enlarged in 1971 to include training. It is an autonomous agency with its own structures and can consult the Executive Authority directly through the Ministry of Education. A special department of planning is responsible for curriculum development and for gearing programmes to manpower needs. The lines of direct connection to educational and training units are through the two respective inspectorates and the regional inspectorates under them, which are responsible for executing the programmes and norms adopted in the institutions and units coming within CONET's jurisdiction. CONET also performs a standard-setting function for technical and vocational education in institutions outside its direct jurisdiction, in terms of access of graduates of these institutions to post-secondary education in institutions which are under its jurisdiction.

CONET's governing board is appointed by the Executive Authority and includes the President and seven other members, three representing technical teachers' associations, two representing associations of enterprises, one representative from the Ministry of Labour, and one representative of industrial training staff associations.

CONET as a whole is responsible for planning, co-ordinating, implementing and evaluating technical and vocational education and training and for co-ordinating school and training centre programmes with the needs of the economy.

# Australia

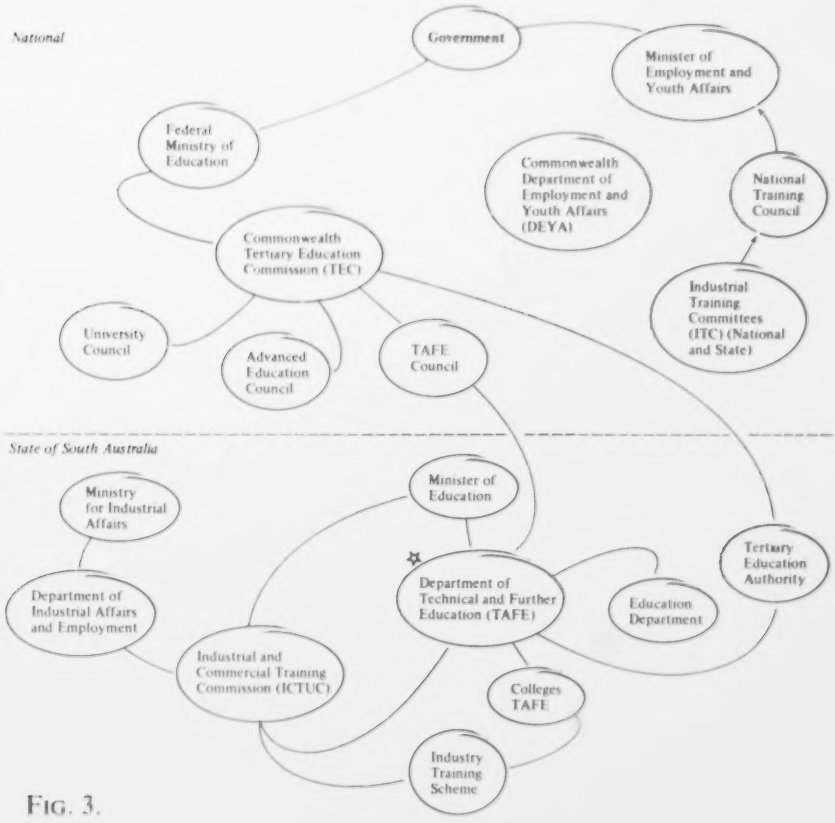


FIG. 3.

FIG. 3. Australia is a federal country with responsibility for education shared between the national authorities and the individual state governments. The national structures for policy-making, planning, coordinating and managing education are roughly paralleled by state structures, where most of the responsibility lies. Because of this federal pattern and the autonomy of the states in educational matters, educational structures have not developed along uniform lines and so vary from state to state. The structure of South Australia is given as an example.

As may be seen from the structural diagram, technical and vocational education is the responsibility of TAFE, the Department of Technical and Further Education. The TAFEs in individual states

receive advice and some of their funds through the TAFE Council at national level. Virtually all technical and vocational education and training in Australia is offered at post-secondary level (see Appendix II), so that TAFE comes within the purview of tertiary education, although the institutions under its authority are distinguished from higher-education institutions: the colleges of advanced education and the universities. The Tertiary Education Authority is responsible for co-ordinating TAFE with higher education. The newly established (1981) Industrial and Commercial Training Commission, under the state Ministry for Industrial Affairs, is the agency through which manpower-planning and employment will be co-ordinated with education.

# Chile

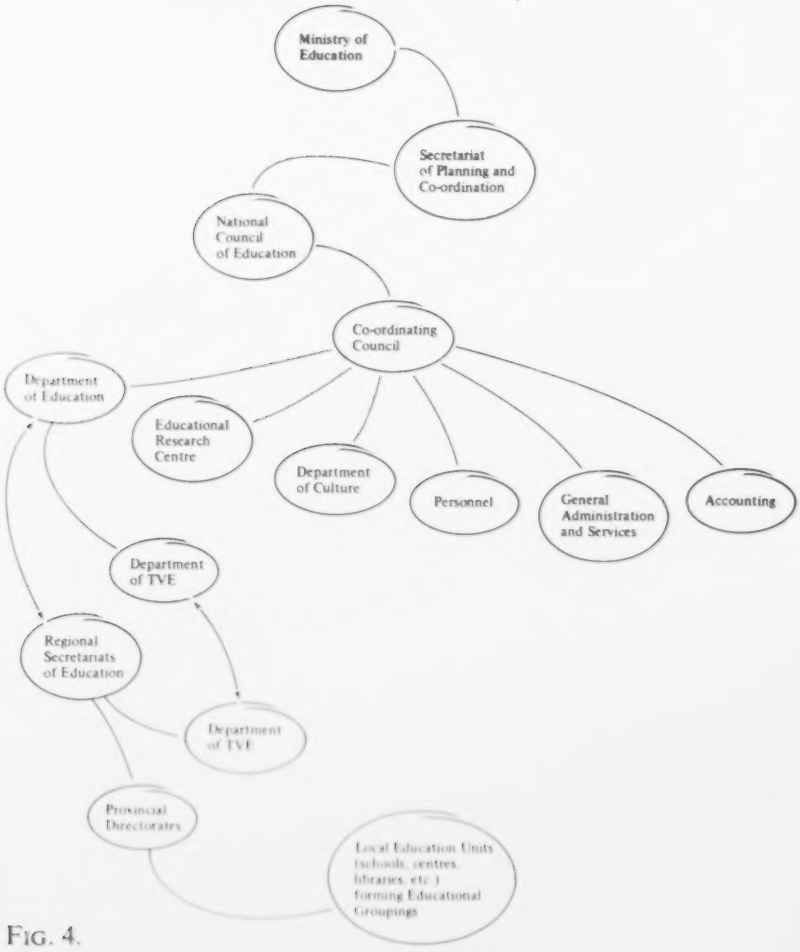
Ministry of Education
Secretariat of Planning and Co-ordination
National Council of Education
Co-ordinating Council
Department of Education
Educational Research Centre
Department of Culture
Personnel
General Administration and Services
Accounting
Department of TVE
Regional Secretariats of Education
Department of TVE
Provincial Directorates
Local Education Units (schools, centres, libraries, etc.) forming Educational Groupings

FIG. 4.

FIG. 4. Chile, like a number of other countries dealt with in the present study, is in the process of reforming its educational system. One of the main objectives of this reform, as may be seen from the structural diagram, is to decentralize the system, giving increased responsibility to regional and local authorities so as to render the system more flexible and more responsive to changing conditions. The policy-making and planning structures for technical and vocational education within the formal system are fully integrated with those for general education. The national-level structures are responsible for overall policy and planning and for accreditation of institutions and programmes, decisions which will be influenced by feedback from the Regional Secretariats of Education. In line with this policy of flexibility and response, the government is engaged in action in two other directions: encouraging private bodies and groups to create technical and vocational education institutions subject to accreditation and supervision by the state, and creating more flexibility within the various modules of the educational system (see Appendix II).

Vocational training for early school-leavers, apprenticeship schemes and many adult education schemes are mostly organized and managed by the National Training Institute (INACAP) for industrial occupations, along with similar institutions for agricultural occupations.

# Czechoslovakia




FIG. 5.

FIG. 5. In Czechoslovakia policy-making, planning and administration for technical and vocational education are fully integrated into a total education system. Overall educational policy is determined by the Federal Assembly of the Czechoslovak Socialist Republic and the legislative bodies of the two federated republics, which have similar structures for education. Policy is centrally administered by the federal government and the Ministries of Education of the Czech Socialist Republic and the Slovak Socialist Republic. The Ministries of Education administer the universities and research institutes directly, while all other educational institutions and installations are administered by the departments of education of the National Committees. The National Committees have special responsibility for co-ordination of educational activities of all kinds and for co-ordination with enterprises and public organizations.

# Ecuador

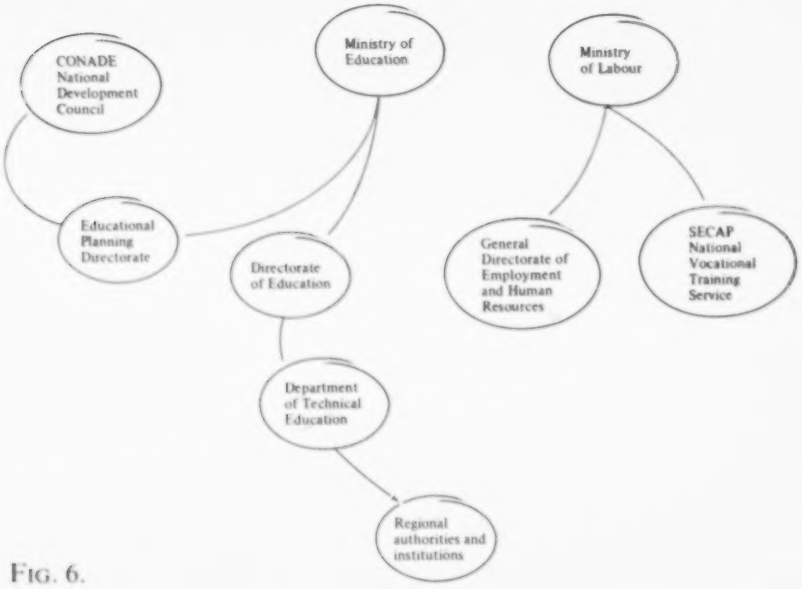


FIG. 6.

FIG. 6. Until very recently technical education within the school system in Ecuador had no separate identity as regards the administrative structure of the educational system. In the late 1970s, however, the country embarked upon a wide-ranging analysis of its educational and training system and its real manpower needs in the context of its development planning. One immediate result of the establishment of the 1980–85 plan was the creation in 1980 of a department of technical education within the Ministry of Education. The country is undertaking a reform of its education system to create a system of education and training that answers to the country's development needs, a programme that will be discussed in Chapter 4. The structures shown here are therefore due to change in the very near future.

# Gambia

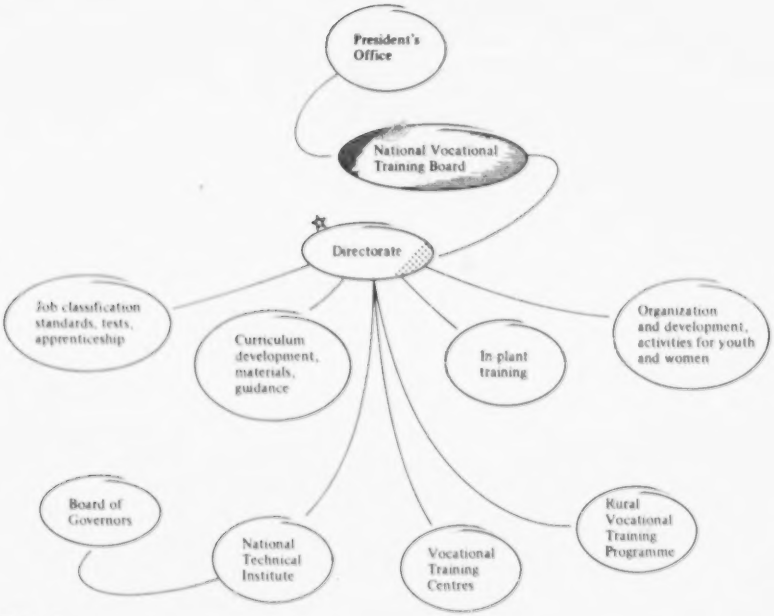


FIG. 7.

FIG. 7. Gambia is a very young country, with an agriculture-based economy and over 80 per cent of its population living in rural areas. On average, only 20 per cent of the school-age population attend school. These factors have meant that the country has had to take a rather specific approach to the organization of technical and vocational education and training. Thus the responsible body, the National Vocational Training Board, is not formally connected with either the Ministry of Education or the Ministry of Labour, but is directly attached to the President's Office. This board formulates policy, is responsible for co-ordination with industry, and through its executive arm, the Directorate, it is responsible for organizing and administering the new training programmes and institutions that are being developed with special emphasis on vocational training in rural areas.

FIG. 8.

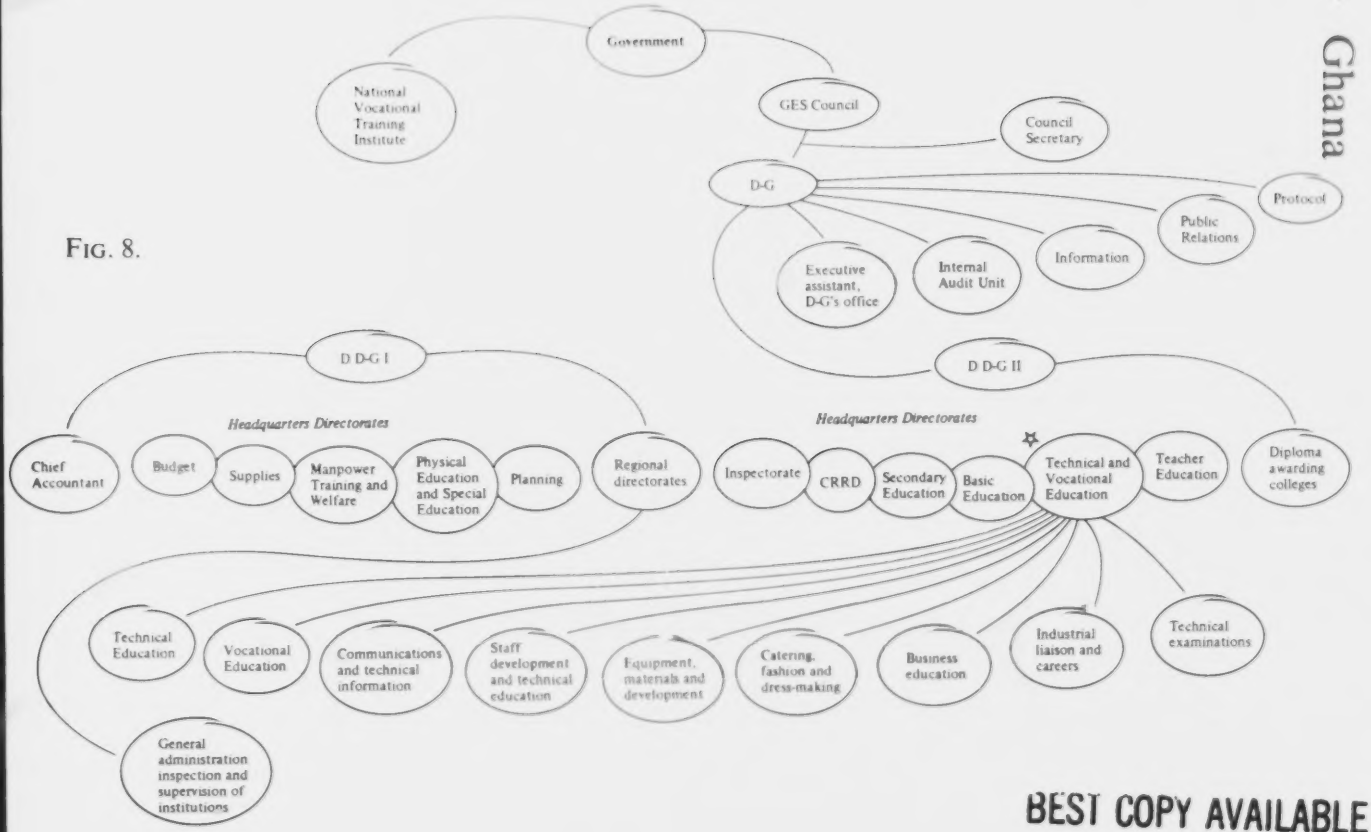


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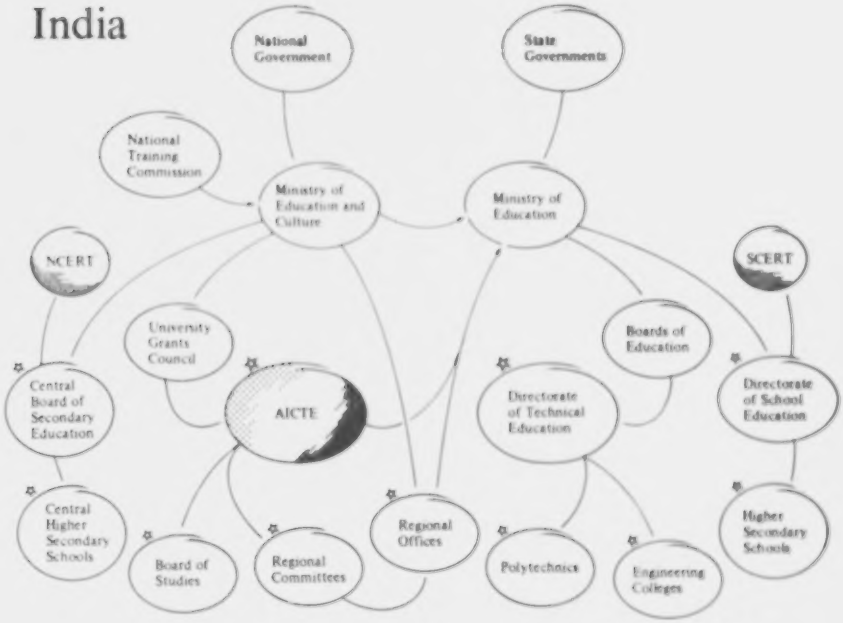
FIG. 8. The Ghana Education Service (GES) is responsible for pre-university education in the country and was created to replace the Ministry of Education and Culture in 1973 as part of a complete restructuring of the education system at that time. The service is headed by the Director-General of Education, who is responsible and accountable to the GES Council and is assisted by two deputy directors. The Technical and Vocational Education Division under one of the deputy directors is responsible for policy and administration. The National Vocational Training Institute is charged with organizing apprenticeship training, developing training standards and trade testing. The diagram is based on the first phase of the reorganization of 1981–82.

# India


National Government
State Governments
National Training Commission
Ministry of Education and Culture
Ministry of Education
NCERT
SCERT
University Grants Council
Boards of Education
Central Board of Secondary Education
AICTE
Directorate of Technical Education
Directorate of School Education
Central Higher Secondary Schools
Board of Studies
Regional Committees
Regional Offices
Polytechnics
Engineering Colleges
Higher Secondary Schools

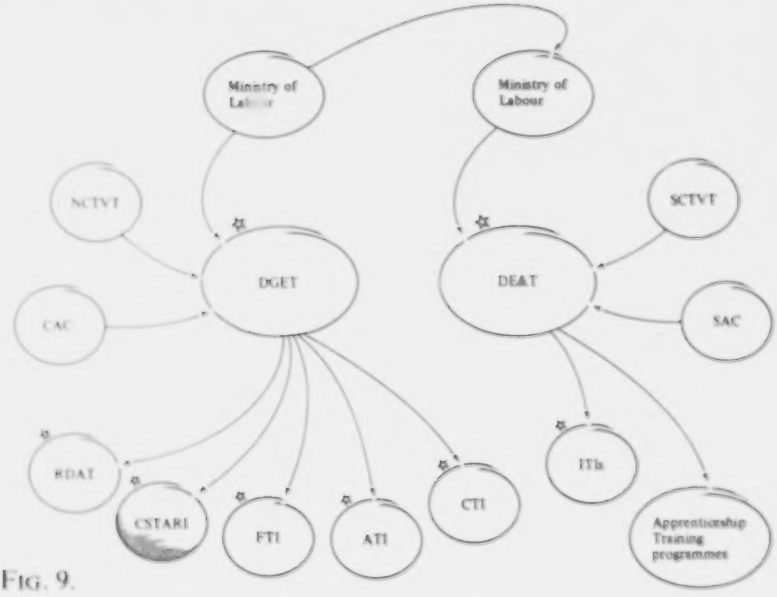

Ministry of Labour
Ministry of Labour
NCTVT
SCTVT
DGET
DEAT
CAC
SAC
BDAT
ITIs
CSTARI
FTI
ATI
CTI
Apprenticeship Training programmes

FIG. 9.

FIG. 9. The central government of India determines overall policy governing technical and vocational education, which is then implemented by the state governments through their Ministries of Education and the state Boards of Education. The keystone to the system is the All India Council for Technical Education (AICTE), a statutory body with planning, advisory, co-ordinating, standard-setting and programme-implementation functions. The Directorates of Technical Education at state level are responsible for technical education in specialized institutions, while the technical and vocational education offered within the general secondary system comes under the responsibility of the Directorates of School Education.

Vocational training and apprenticeship schemes are placed under the Ministry of Labour of the central government and under the ministries in the individual states. Policy is formulated at national level by the Directorate General of Employment and Training in collaboration with the advisory bodies responsible for standard-setting and qualification: the National Council for Training in the Vocational Trades and the Central Apprenticeship Council. These structures are paralleled at state level, where the Directorates of Employment and Training have responsibility for administering the institutions and schemes involved in training.

NCERT: National Council of Educational Research and Training
SCERT: State Council of Educational Research and Training
AICTE: All India Council for Technical Education
RDAT: Regional Directorate of Apprenticeship Training
CSTARI: Central Staff Training and Research Institute
FTI: Foreman Training Institute
ATI: Advanced Training Institute
CTI: Central Training Institute
ITI: Industrial Training Institute
NCTVT: National Council for Training in Vocational Trades
CAC: Central Apprenticeship Council
DGET: Directorate General of Employment and Training
DE&T: Directorate of Employment and Training
SCTVT: State Council for Training in Vocational Trades
SAC: State Apprenticeship Council

# Indonesia

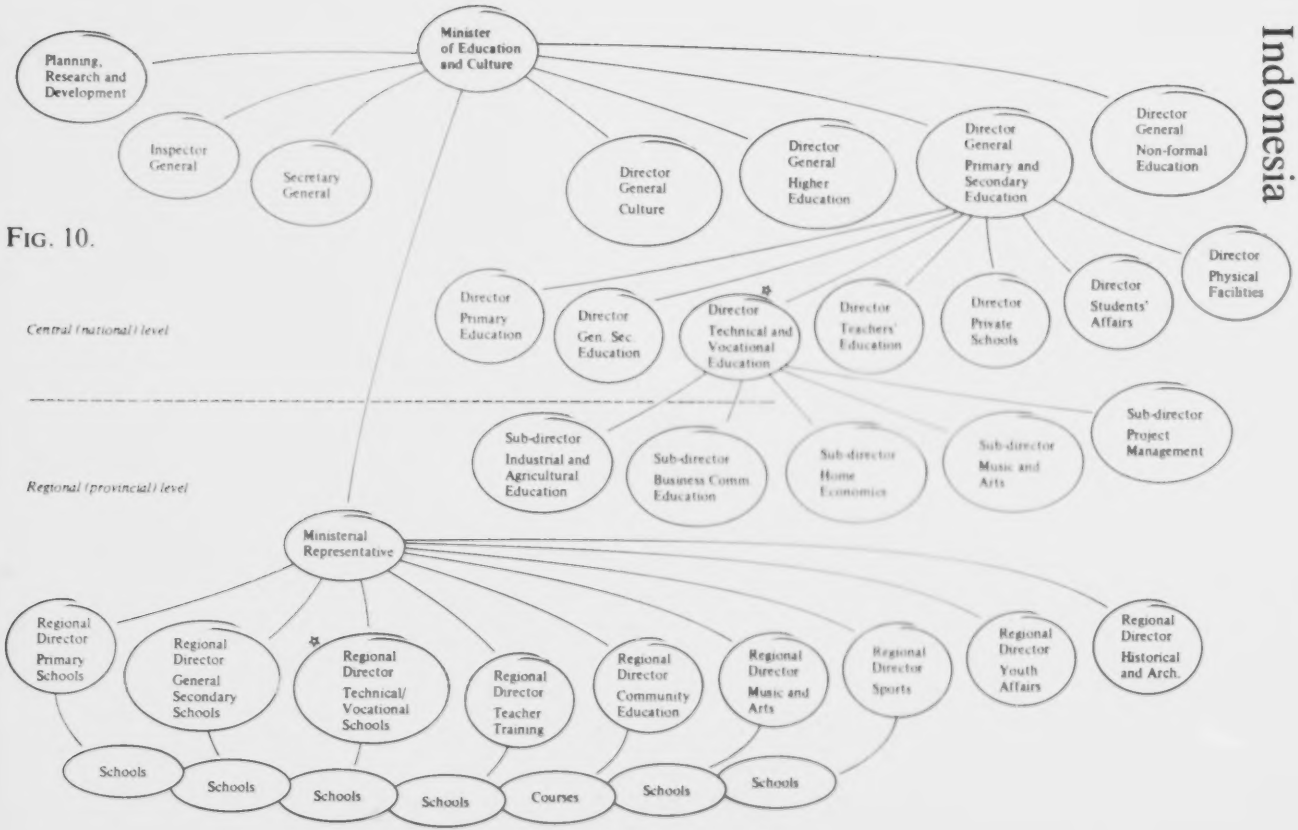



FIG. 10.

FIG. 10. In Indonesia, technical and vocational education within the school system comes under the authority of a Directorate for Technical and Vocational Education attached to the Directorate General for Primary and Secondary Education within the Ministry of Education. This central office at national level is mainly concerned with planning and development, while the Regional Directorates for Technical and Vocational Schools are responsible for day-to-day administration. Policy is determined at national level in accordance with the development planning objectives adopted.

While the Ministry of Education is responsible for the longer courses of technical and vocational education, a number of other ministries are involved in education and training in the fields under their responsibility, for example Agriculture, Industry, Mining and Energy, Communications and Health.

# Ireland

FIG. 11.

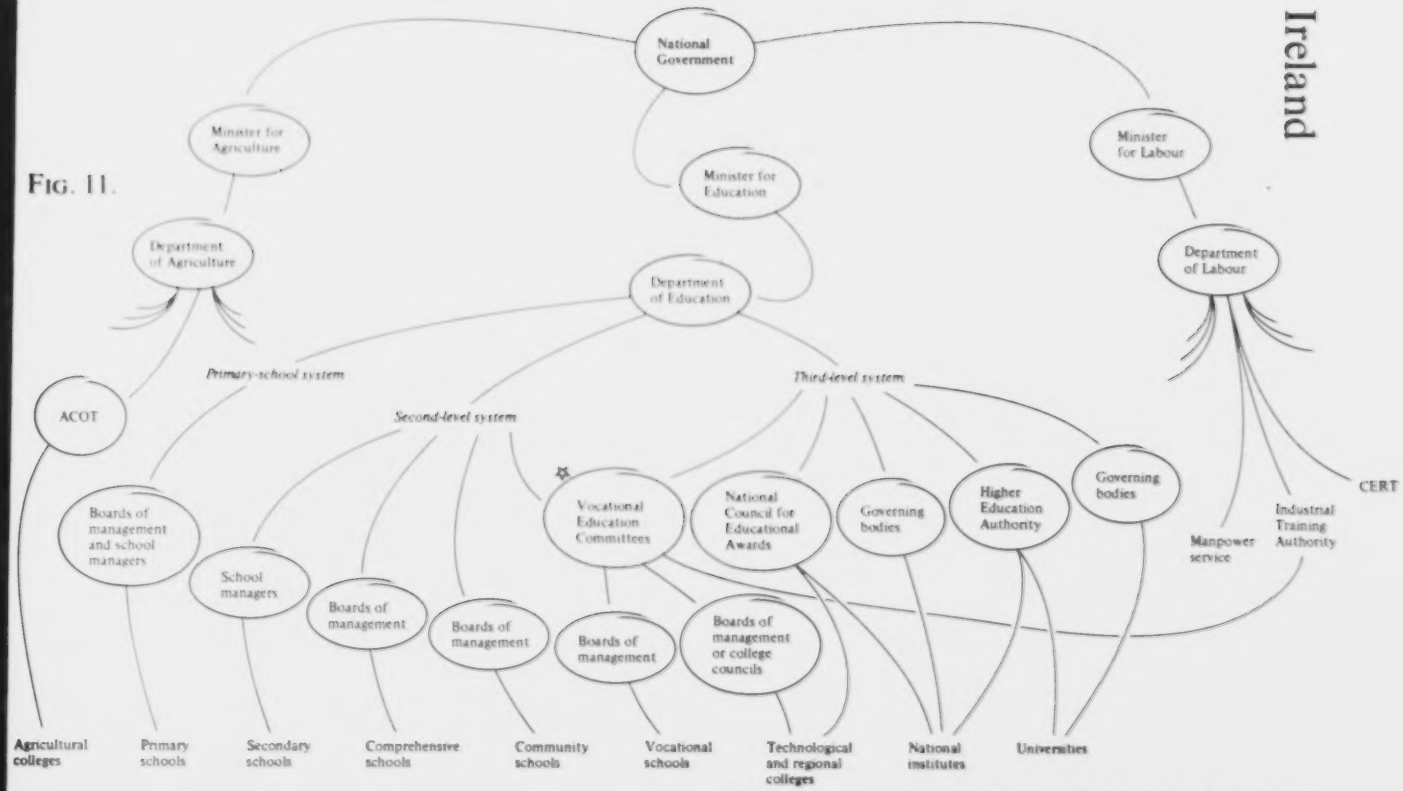





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FIG. 11. The pivotal agency in the Irish structure for technical and vocational education administration is the Vocational Education Committee (VEC). There are thirty-eight of these in the country, corresponding to the counties and boroughs. These bodies are responsible for policy-making and planning for their region as well as for the administration of technical and vocational education. They have a direct line of communication with the Ministry of Education. The Ministry approves the budgets established by the VECs and also ensures that the policies and programmes established conform to national guidelines.

At post-secondary level the National Council for Educational Awards comes into play, as it monitors the standards of many courses and is responsible for making the awards in non-university institutions, both general and technical and vocational.

The VECs also have have a co-ordinating function, in particular with the Industrial Training Authority under the Ministry of Labour, which has wide responsibilities for training in industry. The National Manpower Service, also under the Ministry of Labour, is organized on a regional basis and provides an occupational-guidance and careers-information service, collects information on the labour market and offers assistance in matching employers and job-seekers.

# Lesotho

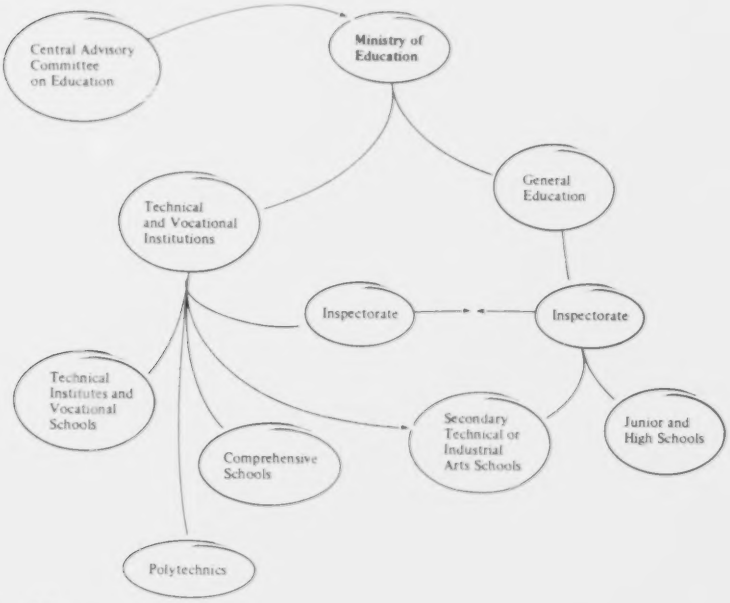


FIG. 12.

FIG. 12. Technical and vocational education in Lesotho is completely integrated into the structures of the Ministry of Education. Since education in Lesotho is largely private, the Minister is advised by a Central Advisory Committee on Education, which is composed of representatives of all interested parties, such as churches, district education committees, chiefs and parents. The Ministry of Education is responsible for policy and staff salaries for the entire system.

# Netherlands

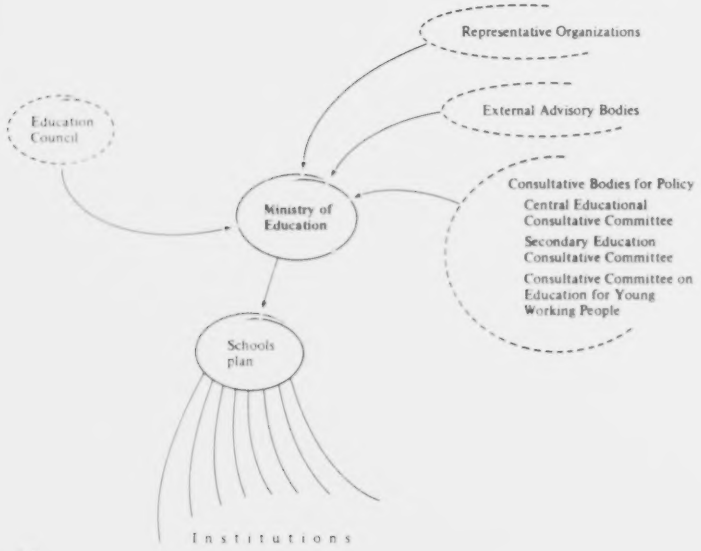


FIG. 13.

FIG. 13. On paper, the structure of technical and vocational education policy-making and management in the Netherlands is very loose-knit as compared with that prevailing in a number of other countries. What must be borne in mind, however, is that two-thirds of all education in the Netherlands is under private or denominational control, a conscious policy in accordance with community wishes and guaranteed by the Constitution. The actual administration of education of all types in the Netherlands is in the hands of individual institutions following policy lines laid down by their governing boards. The Ministry of Education, however, plays a primordial role in maintaining standards in accordance with national policy and institutions must meet the national norms before becoming part of the Schools Plan and hence receiving subsidies from the national government without which they could not function. In setting these standards and in formulating policy, the Ministry of Education is bound to call on a number of advisory and consultative bodies that include representatives of the agencies, organizations and professional groups concerned.

# Sri Lanka

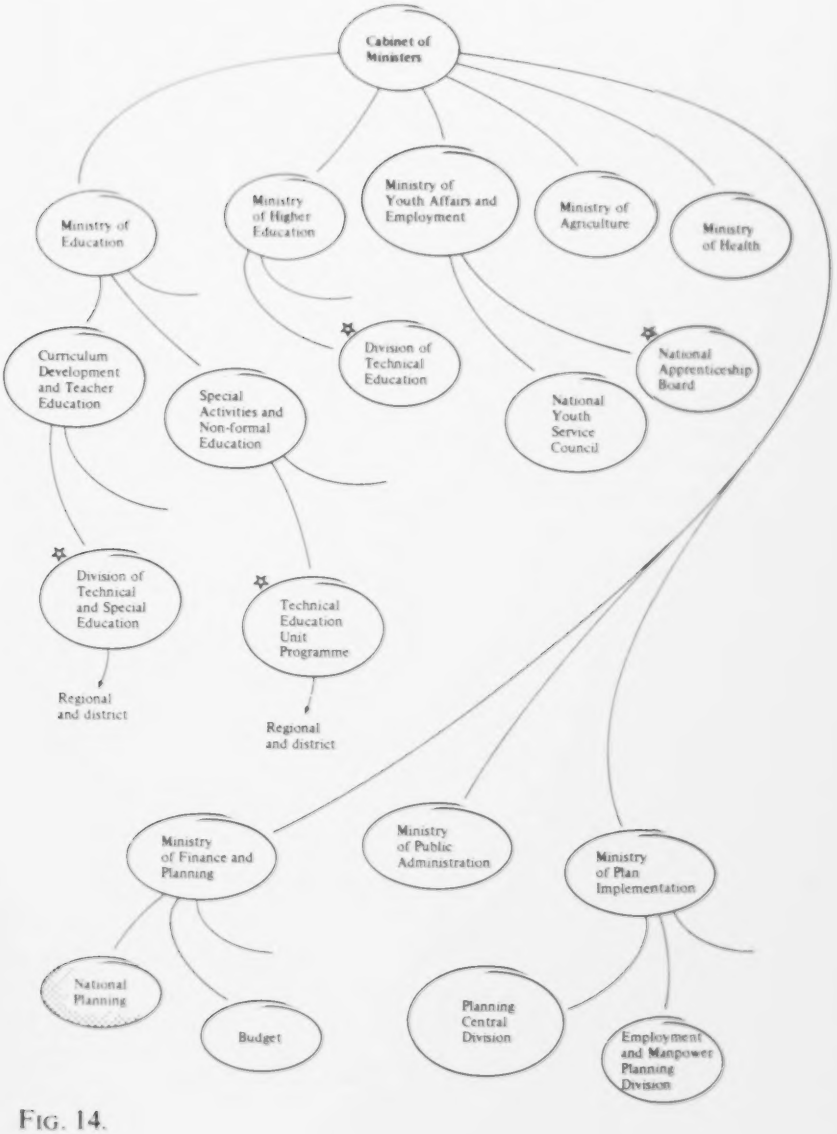


FIG. 14.

FIG. 14. As may be seen from the diagram, in Sri Lanka responsibility for technical and vocational education, whether in terms of policy-making, planning or institutional management, is incumbent upon a number of different ministries and bodies. Under the Ministry of Education institutional supervision and administration are overseen by regional and district educational officers. The Division of Technical and Special Education is responsible for technical subjects in the schools from grade VI upwards, while the Technical Education Unit Programme under another division of the Ministry of Education is responsible for out-of-school courses that nevertheless use school facilities. Upper-secondary and post-secondary technical and vocational education comes under the authority of the Ministry for Higher Education. The National Apprenticeship Board, a statutory body under the Ministry of Youth Affairs and Employment, deals with out-of-school vocational training, while the Ministries of Health and Agriculture run their own training programmes. The Ministries of Finance and Planning and of Plan Implementation deal with planning and co-ordination with manpower-planning and employment.

# Sudan

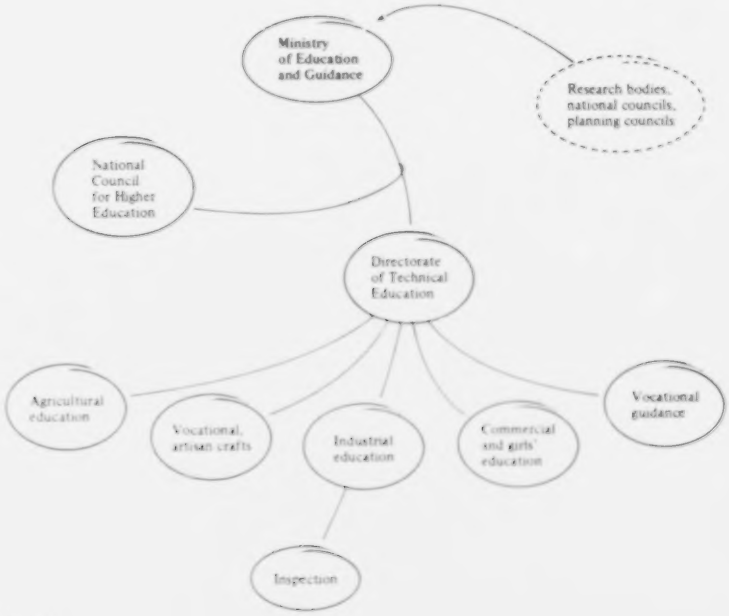


FIG. 15.

FIG. 15. Technical and vocational education in the Sudan are the responsibility of the Directorate of Technical Education, which is under the Ministry of Education and Guidance. It is interesting to note that all education in the Sudan is decentralized, with responsibility residing in the regional administrations, except for technical and vocational education, since this is so closely linked with social and economic development.

Planning of technical and vocational education is carried out within the Ministry of Education, which is advised by various research bodies, national councils and planning councils. Higher technical and vocational education policy-making and planning functions are carried out by the National Council for Higher Education.

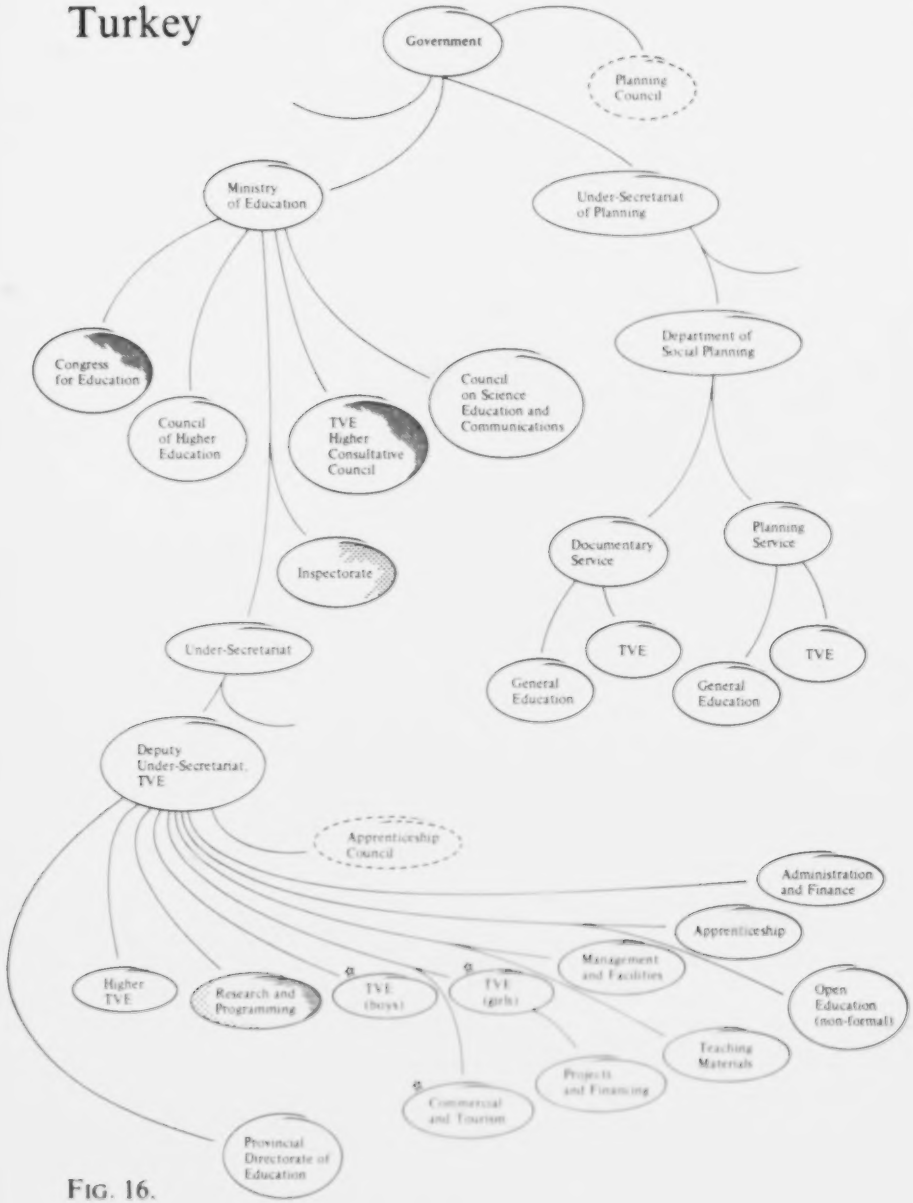


FIG. 16.

FIG. 16. Turkey has a highly centralized education system under the authority of the Ministry of Education. Virtually all technical and

## Patterns and conclusions

The structures presented in the preceding pages are as varied as the countries that designed them. These range in economic development from the least developed countries with a primarily agricultural economy, as in the case of Lesotho, to highly industrialized economies such as Czechoslovakia. In size they vary in scale from the continental, as in the case of Australia or India, to very small countries such as the Netherlands or Gambia. Some of the technical and vocational education systems and the related administrative structures have their roots in the last century, when industrialization was getting under way, while others are only a few years old. Despite this variety a few general patterns may be discerned.

In terms of prime responsibility for setting and executing policy for technical and vocational education and training, there are two major patterns. In the first, virtually all aspects of technical and vocational education and training come under the national educational authorities or are thoroughly integrated into the educational system in some other way. In the second pattern, education and training come under the aegis of separate authorities with degrees of co-ordination that vary considerably from country to country. Argentina, Czechoslovakia, Lesotho, the Netherlands, Sudan and Turkey follow the first pattern; Algeria, Australia, Chile, Ghana, India, Indonesia, Ireland and Sri Lanka the second. Gambia, which falls outside these two patterns, is just embarking on a programme to institute technical and vocational training, and this is being done under the responsibility of a specially created authority.

Some systems are highly centralized, with all major functions residing in the central government or its agencies. In others, state or regional authorities have considerable leeway not only in the day-to-day management and administration of technical and vocational edu-

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FIG. 16. (*cont.*)
vocational education and training, including apprenticeship training, come within the purview of this ministry. Three agencies participate in the policy-making process: the National Education Congress, the Higher Consultative Council on Technical and Vocational Education, and the Apprenticeship Council. Inspection of technical and vocational education is conducted by the central inspectorate responsible for inspection of the whole education system. The results are then communicated to the Deputy Under-Secretary for Technical and Vocational Education.

cation but also in formulating policy and planning for future development. A third pattern may be distinguished in which local authorities or individual institutions take on prime responsibility, but in these cases there are mechanisms at national level setting standards and guidelines that must be followed if the local authorities or institutions are to be accredited or receive public monies to finance their operations. Although there are certainly lines of overlap among these patterns within some of the countries under study, the sixteen may generally be classified as follows: a high degree of centralization in terms of policy-making, planning and administration characterizes Algeria, Czechoslovakia, Gambia, Ghana, Sudan and Turkey. This list calls for several qualifying comments. Algeria, Czechoslovakia and Turkey for varying reasons have histories of a high degree of administrative organization. For the other four countries the fact of centralization is not so much a matter of historical development as of the present need to make provision for technical and vocational education where nothing or virtually nothing existed previously or to bring together under one head a series of disparate provisions and institutions. In this respect, it is interesting to note that while general education in Sudan is highly decentralized, technical and vocational education has been placed under the direct authority of the central government. In Gambia, much the same situation prevails in that, since there was virtually no provision until very recently for any kind of technical and vocational education or training, the newly created National Vocational Training Board responsible for this education and training is directly attached to the President's Office and hence is independent of both the educational and the labour authorities. In Australia, Argentina, Chile, India, Indonesia and Sri Lanka, varying degrees of decentralization prevail. In Australia and India, the individual states have considerable authority in setting and implementing educational policy. Major policy and planning are, however, carried out at national level, particularly in India. In Argentina, Chile, Indonesia and Sri Lanka, most of the policy formulation and planning is conducted at national level, while direct administration is handled by the individual regions and local authorities. Chile is in fact engaged in a conscious policy of decentralization in order to spread responsibility for technical and vocational education and training more widely throughout the community and more will be said about this in the following chapter. In Ireland, Lesotho and the Netherlands, most policy-making and administrative authority resides in local authorities (Ireland) or in institutions (the Netherlands and Lesotho), with the national educational and training authorities setting standards and guidelines for performance enforced by their power to grant or withhold subsidies.

In virtually all of these countries, various advisory and repre-

sentative councils play an important, and often central, role, as in the case of the All India Council for Technical Education or the National Council of Technical and Vocational Education (CONET) in Argentina. These councils, constituted with varying degrees of power, are most often designed to advise in policy and planning and to serve a co-ordination function, in some cases among various types of technical and vocational education, in others between education and out-of-school training and in still others between education and training and employment. These will be more fully dealt with in the following chapter.

The structures presented in the preceding pages, then, represent the basic framework for formulating policy, planning for the future and administering technical and vocational education. With but few exceptions they are of fairly recent origin, a fact which serves as a concrete illustration of the priority now being accorded technical and vocational education. In the chapters which follow an attempt will be made to look at the living experience behind the charts.

# 3 Policy and planning

The reports from the countries concerned in this study as well as the Final Report of the International Experts Meeting on Technical and Vocational Education amply demonstrate that a consensus exists on general policy objectives and that these are in accordance with the Unesco Revised Recommendation concerning Technical and Vocational Education viewed as an essential factor in the development process on two major grounds, economic and social. Economic development presupposes the availability of skilled manpower. This is as true for industrialized countries retooling their industries or encouraging the development of new ones as it is for the least-developed countries (LDCs) whose economy is agriculture-based and who need to render their agriculture more productive and to expand their exports. At an even more basic level, economic development depends upon a healthy and well-nourished population, which in turn for many populous countries, and not just the LDCs, is dependent upon modernizing the agricultural sector and therefore upon education and training directed to the special needs of the rural populations. In social terms, technical and vocational education is directed to preparing young people for employment in fields corresponding to their talents and aspirations and to ensuring that adults can adapt to changes in the employment structure and in their own ambitions so as to achieve career and personal satisfaction, and therefore to promoting development of a cohesive and democratic society.

Thus in broad terms all of the countries have adopted general policy objectives for technical and vocational education directed to integrating it into the educational process as a whole and indeed to making it one of the most important elements in that process. To this end, most have adopted as a major objective the introduction of general technical and vocational subjects into the general education curriculum, generally at lower secondary level, that is towards the end of general education common to all children and where possible compulsory, and in some cases at primary level. Furthermore, general policies have been designed to increase the number of young people

going into technical and vocational education as preparation for employment and to broaden the opportunities of those who do so for access to higher education, either immediately after completion of the secondary programme or later after time spent in employment.

Such policies have only recently been adopted in a number of countries, which began reform of their educational systems in the late 1960s and 1970s. There are, of course, a number of barriers to their full implementation and some of these are not limited to developing countries alone but are to be found in industrialized countries as well. Attitudes and values with regard to education head the list of the most frequent barriers: scientific and literary education and the occupations and professions to which these lead enjoy the greatest prestige and come first in the scale of ambitions of young people and their families. Finding ways of enhancing the value placed on technical and vocational education by individuals and society is therefore one of the greatest challenges facing countries attempting to implement these broad objectives and is indeed a recurring element in most of the country reports. In terms of material barriers, the problem for developing countries is sheer lack of financial resources to build, maintain and operate the facilities, and to train and pay qualified staff. In view of such problems the only possible approach is to determine specific policy objectives suited to the cultural, social and economic circumstances and aspirations of the particular country concerned and secondly to make every effort to ensure that these objectives are in fact attainable and will thus contribute to achievement of the broader aims.

Policy objectives for technical and vocational education have thus to be set within specific national contexts, and the factors determining the specificity of the national context will be paramount considerations in setting these objectives. Among such factors are the social context, the structure of government, the economic context, the historical and cultural context, overall educational policy, development objectives and, of course, the resources available.

The structure of government will, for example, determine the extent to which technical and vocational education policy objectives are set and implemented by a national goverment. In a federal structure, as in Australia or India, the state governments play a considerable policy-making role and so may set objectives that correspond to national policy guidelines and at the same time are geared to specific local conditions. Where governments are more centralized, as in Czechoslovakia or Turkey, the national government has prime responsibility for policy formulation, and there is a greater or lesser degree of consultation with local authorities. Another approach is to be found in countries such as Ireland with a strong tradition of municipal or local government, in which case policies set at local level have a greater influence on national policy overall. There are obviously advantages

and disadvantages to each approach, for example more flexibility and faster response to changed conditions in the case of smaller political units, and on the other hand, in the case of more centralized policy formulation, possibilities for more coherent overall policy and better co-ordination with other national policies concerning employment and economic development.

The social context plays a key role in the setting of technical and vocational education policy objectives in that it determines the demands made upon education. Social demands may be both qualitative and quantitative. The qualitative demands depend on the values held by society. For example, where democratic values are deeply rooted, society will demand that education be available to all without discrimination and on a basis of equality. Where productive work is held in esteem, demands will be placed on education to prepare young people for this. Where a high value is placed upon education, those providing it will be accorded a high status. Quantitative demands, while closely linked to the value structure, are also tied up with the demographic process, and likewise play a vital role in policy formulation. In a country such as Sri Lanka, for example, there has been a considerable and successful effort over the last twenty years to offer primary education to all and secondary education to many. This has led to large numbers of educated unemployed and unemployable young people, necessitating a redefinition of educational objectives as the result of a quantitative social demand for much greater emphasis on technical and vocational education. Such quantitative demands made on the educational system because of pressing necessities can also lead to formulation of policies which represent a conscious and carefully weighed decision to defer meeting certain qualitative social demands. Gambia is a case in point. The government feels that for the moment it must postpone the expansion of secondary education so as to avoid further exacerbating the problem of educated urban unemployed youth with the attendant social problems arising out of frustration, disillusion and unfulfilled expectations. The hard choice was then made to develop primary education and adult training programmes with a vocational bias in rural areas so as to begin catering to the real needs of the vast majority of the population. Such demands are of course also very closely linked to the economic context and development objectives.

The economic context is the factor that has the most direct influence on the objectives set for technical and vocational education. The type of economic organization, e.g. market-oriented or planned or a combination of the two, will determine policies as to the organization of technical and vocational education and training, as to who should be involved in its planning and execution and how, and as to what kinds of programme should be offered to whom and to what end. The

economic base will determine to a great extent the policies adopted as to content of education and training, whether it is to be primarily industrially and business oriented or oriented to agriculture, or if oriented to the two, in what proportions. The example of Gambia, with its economy primarily based on agriculture, has been cited, and Sudan is another example. Because of this bias, technical and vocational education in both these countries will be oriented to a rural economy and to food-processing industries. In economies that are industrially based, whether planned or market oriented, the present and projected demand for industrial manpower is a major consideration in establishing policy objectives. In those countries where unemployment is a problem, whether for demographic and development reasons or because of changes in industrial and economic structure, technical and vocational education and training policy will be geared to solving this problem. Thus in a number of developing countries, such as Chile, India and Sri Lanka, and to a different degree in some sub-Saharan African countries, although industrialization is under way, industry cannot absorb in the foreseeable future all the products of the education and training systems. Here the problem is one of economic take-off, and the present industrial base will not allow for this. Thus an important objective in these countries is to gear technical and vocational education to providing people with the skills they need for creating their own enterprises, no matter on how modest a level, so as to create jobs and further economic expansion. In industrialized countries, the economic context often imposes other restraints. Older and inefficient industries have to retool, and new high-technology industries must be promoted in order to sustain economic growth. Thus people have to be trained for different kinds of jobs or be retrained, and this must of necessity enter into the technical and vocational education policy-making process. For all countries, present and projected manpower shortages, whether in terms of economic sectors, or in terms of skill levels, must enter into policy considerations. In terms of skill levels, for instance, a number of developing countries lack middle-level manpower; and in reviewing their technical and vocational education and training policies over the last decade this concern is evident in the emphasis given to developing technician training at upper-secondary and post-secondary levels. Algeria, Ghana, India, Sri Lanka and Turkey may be cited in this respect.

Development objectives which are set in accordance with social policies and demands and the present level and desired directions of economic development are also a major factor in determining technical and vocational education policy. If, given the level of development and the economic context, rural development is the top priority, as in Ghana, Gambia, Lesotho and Sudan, then the major objective of technical and vocational education will be to improve the farming

skills and standard of living of the rural populations. If the industrial base is there, but a real shortage of manpower exists because of low birth rates, as in a number of socialist countries, the objective of further industrial development means that pride of place will be given to strengthening the technical and vocational education and training systems so as to meet these needs. Should a major objective be to bring in foreign industry to strengthen an existing industrial base, as is the case in Ireland, with its policy of encouraging the establishment of high-technology industry, then the country has to make provision for training the required skilled manpower in order to attract such industry. Technical and vocational education policy is then geared accordingly. The basic problem in this respect is to set objectives for technical and vocational education and training that are designed to contribute to achievement of development objectives, which will of course remain a dead letter without properly trained and motivated people.

It is axiomatic that any policy has to be geared to available resources in financial and human terms if it is to be implemented. Indeed the meagre resources in terms of money, and often therefore in terms of trained staff, available to many developing countries constitute the major barrier to the development of technical and vocational education. Here we enter into the vicious circle of poverty leading to even greater poverty. The problem is how to break out of this circle, and the process is not an easy one. In this respect, seeking external financial assistance and training has in many cases proved to be a positive step towards giving impetus to endogenous development for a number of the less-developed countries. But for all countries the problem of resources is one of judicious allocation of the funds and people available so as to make the most of what is at hand. The problem of resources will be discussed in detail in a later chapter; here it is enough to say that the quality and quantity of resources available must perforce be a vital factor in formulating any policy for technical and vocational education that can be qualified as realistic.

Technical and vocational education policy is, or should be, incorporated into overall educational policy, which itself is of course determined by the factors discussed above. If the major objective of education is defined as preparing an academic élite, then technical and vocational education will be given very little space in the system. If, on the other hand, education is viewed as having a larger role of catering to the needs and aspirations of all while serving larger social and economic objectives, then technical and vocational education policy will be an integral part of overall education policy. It is in the latter direction that education policy is tending, even if in many countries much remains to be done before the goal is achieved, and all of the country reports bear witness to this trend.

The historical and cultural context is the matrix for all the other

factors. It is within this parameter that individual and collective decisions are consciously or unconsciously made, that change, evolutionary or revolutionary, takes place. It is therefore not an active factor in policy-making, but greater awareness of this context may mean that policies can be developed that have a better chance of working. A better understanding of this context on the part of an outside observer, moreover, may allow him to assist the country better if he is acting in the capacity of counsellor or to see what might or might not be applicable in his own country if he is looking to the experience of others as a guide. What works beautifully in one historical and cultural context will generally not work so well or even at all in another context without profound modification and adaptation.

These then are the factors determining technical and vocational education policy objectives. The process is, however, not static or one-way, but rather dynamic and interactive. Policy adopted and implemented for technical and vocational education can and should influence change in the other factors where change is called for. Indeed, sound technical and vocational education policy should be directed precisely to changing social values when these militate against democracy, to improving the economic context by rendering the country more productive and the standard of living of individuals and families higher; that is to achieving development objectives. In the process, more resources, human and material, will be created to devote to this effort, and a greater portion of available resources will be allocated to it. Figure 17 is a highly simplified representation and summing up of these very complex relationships.

Policy-makers and planners in the field of technical and vocational education must be aware of the interplay of these factors if viable policies are to be formulated and implemented. Given the complexity of their interaction, this is certainly not an easy task. Several countries reported on policy objectives that proved when implemented to be ill-conceived or to have led to unanticipated problems and on the correctives that are being taken to redress the situation.

Having observed that the former system, which included vocational schools training to craftsman level, was simply training people who were considered second-class citizens from a professional point of view, Algeria decided to upgrade the education given in these schools so as to produce secondary-school leavers either qualified as junior technicians or prepared to go on to higher technical education. This policy was designed to introduce flexibility into the education system and to produce much-needed middle-level personnel for industrial development. After nearly a decade of experience, however, this policy proved inadequate. Skilled workers were no longer trained within the educational system, and those pursuing their studies in the technicums for junior technicians did not correspond to employment requirements

FIG. 17. Relationships affecting education policy.

after graduation. Furthermore, it proved impossible materially and in terms of staff to convert the former vocational schools into technical schools. Those students attending the technical lycées had one goal in mind: higher education; and in fact most of those entering upper secondary or higher education came from the general education streams. Many education and training programmes then moved out of the education system, with a consequent lack of co-ordination, while out-of-school programmes for those dropping out or leaving at an early age remain at the stage of projects.

Clearly aware of these results, and having carefully examined the problem, the authorities are now trying to introduce correctives. In the first place, within the framework of the current four-year development plan, a Secretariat of State for secondary and technical education has been created with the primary mission of promoting technical education throughout the school system. The major policy-making organ for technical and vocational education comes under the authority of the Ministry of Planning and National Development. A number of interministerial committees have been set up to look more closely into the problems and to find solutions so that the educational system, with its bias towards general culture to the detriment of practical experience, may be better adapted to contribute to achievement of national development objectives.

In line with the Algerian experience, both Ireland and Turkey have found that in 'upgrading' their secondary vocational education by introducing more subjects of general culture and a more theoretical approach to technologies, vocational education has been the loser. Again, the ambition is to enter into the higher education system, which cannot absorb all those demanding entrance, just as the economy cannot absorb all those leaving at this level. Here again is an example of attitudes and social values that are at variance with real social and individual necessities. The problem is to strike a balance among these in policy objectives.

Sri Lanka provides yet another illustration of the contradictions that may arise from a well-intentioned and theoretically sound policy. Since the late 1950s, the thrust of educational policy was to offer a basic general education to all. This goal was to a large extent achieved; but, beginning in the 1970s, it became evident that the economy could not absorb all the school-leavers, whether primary or secondary, that were available on the labour market. A pattern began that had numerous and complex effects on domestic policy. On the one hand, there was and is the fact of the 'brain drain': highly trained graduates from the education system could find better jobs abroad, given the level of national development and the salaries available to graduates. Furthermore, the national economy simply could not absorb all of the secondary-school leavers with a good general education but no preparation whatsoever for the world of work. The result was massive emigration, which certainly took pressure off the domestic economy and social structure but also created manpower shortages in sectors earmarked for national development. In consequence, the country is now giving very high priority to technical and vocational education both within the general education system and as preparation for employment. The government seems to have taken a very down-to-earth attitude. Trained people are needed for the economic sectors called upon to give impetus to the country's development, but those who find superior opportunities outside the country and whom the labour market cannot at present absorb will be better prepared to make their way elsewhere and eventually return with needed skills or the financial capacity to create new assets and therefore jobs. Sri Lanka is then a success story carrying within it the seeds of new problems, and new correctives are being introduced.

## Procedures for policy formulation

The procedures for policy formulation are extremely varied. Depending on governmental structures and traditions, with development levels an important factor, policy may be primarily determined at

national level or may arise from and be initiated at local level. Responsibility for policy formulation may lie with a central planning agency, where this exists, and in many developing countries resides with the agencies and authorities responsible for the national development plan. In a number of countries, statutory consultative and advisory bodies and ad hoc committees play a large role in advising governments on policy issues. The experience of three countries, Chile, India and Ireland, is briefly discussed below to illustrate how some of these procedures function.

In Chile all educational policy, and, given the emphasis which the government now places on it, especially policy respecting vocational education and training, is developed as a function of objectives laid down in the five-year national indicative development plans. Indeed, reform of the educational system was undertaken in 1979 as an important chapter in the 1978–83 plan. Concrete educational objectives were formulated in that plan: equal opportunity of access to knowledge and culture; education directed to facilitating employment; educational financing devoted as a priority to the sectors due to be expanded so as to ensure achievement of the first two objectives; and, finally, improvement of the training provided for teachers and of their status and working conditions. The major objective of the educational system is to establish a system of education and training that offers educational alternatives so as to provide more opportunities to all and to facilitate productive work on the part of the whole population.

These objectives were formulated on the basis of studies carried out in the 1970s on the country's economic and manpower situation with a view to establishing development plans. Two major studies were carried out in Chilean universities by the Economics Department of the University of Chile and by the Universite del Norte. The question of a sound information base is crucial in setting policy objectives and drawing up plans and strategies for implementing them, a point that arose in a number of the country reports. Chile appears very well aware of this problem and is taking steps to provide the information base on the economy and the labour market from which technical and vocational policy-makers and planners can work. At the national level, an office is to be created under the Ministry of Labour for collecting information on the employment and training situation. The country is also engaged in a general effort of information-gathering to establish maps of education, training, employment and occupational classifications. Policy formulation for technical and vocational education in Chile is thus currently conducted at national level. The plans are intended, however, to decentralize the education system radically and to encourage the creation and financing of new facilities by private bodies and agencies. The national authorities will still set national policy but on the basis of more information and representation coming

up through the system, and will ensure that national standards are met.

India is such a vast and complex country that any description of its systems must be very oversimplified. Technical and vocational education at both national and state levels is designed and administered by a number of ministerial and advisory bodies and statutory boards as shown in the diagram on page 32. The major bodies involved in policy formulation are the All India Council for Technical Education (AICTE) for upper and post-secondary technician and engineering education, the National Council for Educational Research and Training (NCERT), which is especially involved in the vocationalization of general education and curriculum co-ordination, with training institutes run by the third major body, the National Council for Training in the Vocational Trades (NCTVT) under the Ministry of Labour, which is responsible for craftsman training and trade certification standards. Although there are no official lines of co-ordination, these bodies do co-operate with one another on an ad hoc basis, and indeed ad hoc commissions and working groups play a considerable role in India in initiating research geared to analysing problems and presenting the results to the Government of India as a basis for policy formulation. The Indian report cited a recent example of such ad hoc co-ordination: in 1978 a committee was appointed to examine the quality of training offered to apprentices and trainees in the Industrial Training Institutes under the NCTVT; at this time the NCTVT called upon the NCERT to work in co-ordination with its own state counterparts to work out model curricula and to provide state governments with guidelines for implementing technical and vocational education. Examples of the role of ad hoc working groups in policy formulation can also be cited. The Minister of Education, on the advice of the AICTE, set up a working group in 1977 to review the status of technical and vocational education and to identify areas for development in the context of national needs during the 1980s and to make recommendations for reorientation of education to meet these needs. The recommendations of this group were then submitted by the AICTE to the government for drawing up proposals under the sixth plan. The country report from India was itself an example of the fruitful ad hoc co-ordination practised in that country: the planning committee for the report included representatives from NCERT and the Madras state CERT, from the Ministry of Education, from the Board of Apprenticeship Training, from an advanced training institute, and from the administration for craftsman training. The report itself was drawn up by a faculty member of the Technical Teachers Training Institute, Madras. This forthright report made three major points in regard to problems involved in establishing technical and vocational education policy, problems which were touched on in a number of the other reports: official channels of co-ordination among

the many agencies involved in designing and implementing technical and vocational education and training are virtually non-existent; there are no mechanisms for monitoring through a systems approach to planning, programming, implementation and evaluation of technical and vocational education and training or for the establishment of new policy objectives in the light of the results observed; and there is no reliable information system upon which such policy formulation and planning can be based.

Ireland does not have a strong industrial base; nor is there a tradition of central government planning of education or the economy. As noted earlier, local bodies, the Vocational Education Councils (VECs), have since the 1930s been primarily responsible for ensuring that technical and vocational education is available in their communities. These bodies are composed of elected representatives and representatives from professional groups or local industry and the economy. Their influence has grown as programmes have been developed in wider areas of technical and adult education that are not related to the national Department of Education syllabuses. Thus adaptability and flexibility in setting policy and implementing programmes when a need is discerned are the two major characteristics of this system; the Educational Department at national level is of course the other partner in formulating technical and vocational education policy. In the early 1960s, for example, the Department, in co-operation with the Organisation for Economic Co-operation and Development (OECD), initiated a thorough study of the Irish education system, including future directions of development and taking into consideration a factor already in evidence at that time: the emerging needs for skilled manpower in the developing economy. The resulting report had a profound influence on the direction of educational policy in the country: greater emphasis was given to developing comprehensive schooling and technical and vocational education, and the Education Department established a Development Unit to ensure continuous review and better planning of the education system. Regional technical colleges were expanded to spearhead industrial development. Guidelines established at national level are used by the local VECs in establishing their policy.

One Irish programme provides a concrete illustration of the way these policy-formulation procedures work: the pre-employment courses. These are designed for those who are interested in taking up employment at school-leaving age after the junior secondary cycle. The staffs of some vocational schools recognized that these young people were simply not prepared for employment and therefore initiated the pre-employment course to bridge the gap between the world of school and the world of work. Such courses were instituted on a pilot basis in several schools and closely monitored by the Department

of Education. Because of the positive results, the Department encouraged the establishment of other such courses. As a result, in 1980, within three years of their initiation, 120 such courses were being offered, for the most part in vocational schools catering for more than 2,000 students.

In virtually all the developing countries submitting reports for the present study, technical and vocational education and training policy is formulated through procedures closely tied to the overall development planning process. Indeed, in Algeria, Chile, Ecuador, Gambia, India, Indonesia, Sri Lanka and Turkey major policy objectives are defined in the plan or by the planning authorities, although in consultation with the agencies responsible for implementing this policy. Czechoslovakia in another context also provides an example of policy formulation at national level: since the country has a planned economy, technical and vocational education and training policy is naturally laid down along with overall economic objectives. The role of advisory bodies, both statutory and non-statutory in India, and the role of ad hoc commissions and reviews in India and Ireland has already been mentioned. Further examples may be found in Sri Lanka, the Netherlands and Australia.

As already noted with regard to the report from India, where they are explicitly stated, the three major problems facing those responsible for formulating technical and vocational education and training policy are lack of a solid information base, of co-ordination among the various agencies responsible for planning, setting policy and implementing technical and vocational education and training and, thirdly, of structures for evaluation of policy effectiveness. The following sections consider in somewhat greater detail what is being done in these fields.

## Linkage and co-ordination with economic, manpower and employment policies

It is generally agreed that linkage between technical and vocational education policy and economic, manpower and employment policy is at the crux of the problem of designing truly effective technical and vocational education. Awareness of the problem is virtually universal. In those countries with national development plans there is, of course, input from all sectors to the structures responsible for planning, but the agencies and people involved in providing the input and assuming responsibility for executing policy may not be in contact with one another in the process. Such contact on a formal rather than an ad hoc basis is essential if the policy objectives are to be compatible with one another and above all are to be realistic in terms of their chances of

success. The situation is highly complicated by the fact that in many countries responsibilities for technical and vocational education and training are spread among a number of agencies and ministries, most often for historical reasons.

The experience of two countries, Australia and Sri Lanka, demonstrates the kinds of structures that are now being set up or are envisaged to ensure such linkage and at the same time indicates the problems involved.

As may be seen from the diagram of the Australian system, there are a number of lines of co-ordination among the various agencies responsible for technical and vocational education and training. There is, however, no one agency at either federal or state level which co-ordinates policy formulation and planning for the whole system. The report in fact states that only in the last two years have there been serious efforts to co-ordinate manpower planning with the education and training system. At national level, the Ministry of Employment and Youth Affairs offers advice on policy formulation to the Min' try of Education, and roughly equivalent structures exist at state level. In South Australia the Department of Industrial Affairs and Employment (DIAE) advises the state government on manpower needs and the government instructs the Department of TAFE on the areas that should be given priority. The DIAE provides services to industry and commerce in respect of manpower and training matters, and also has a Council on Technological Change and a Manpower Forecasting Unit. New structures designed for co-ordination are now being put in place. In South Australia, an Industrial and Commercial Training Commission has been established under the state Ministry for Industrial Affairs and has potentially wide powers. Its mission is to inquire into, and keep under review, all the training being provided to meet needs in industry and commerce. This agency has access to employer associations, trade unions, the DIAE and the Department of TAFE at state level, and at national level to the National Training Council, the National Industry Training Committees and the Department of Employment and Youth Affairs. Since the commission was only established in 1981 it is not yet operating at full capacity. The present legislation gives the commission (which is composed of people with industrial rather than educational experience) fairly wide powers over TAFE which is the largest sector of tertiary education.

The Sri Lanka report provides an excellent analysis of the problems involved in establishing formal structures for co-ordinating all aspects of technical and vocational education and training with analyses of manpower needs and economic and employment policy in a situation that has developed historically in such a way as to render such co-ordination both essential and exceedingly difficult to achieve.

Over the last two decades, as technical and vocational education

and training have developed in Sri Lanka, the need for co-ordination of this development has been recognized in various reviews of national policies and systems by both domestic and outside observers. From time to time, suggestions have been made for the creation of a central body to co-ordinate the in-school and out-of-school education and training offered by the different ministries and agencies. By default, in a sense, the co-ordinating function was assigned to the national planning authorities, but, as was pointed out in the report, this co-ordination of policy objectives and planning could have been more thoroughly performed by an agency specifically entrusted with the task rather than by the planning authorities, who could not possibly be aware of all aspects of the situation. At the end of the 1970s several actions were undertaken, one within the Ministry of Education and the other within the Ministry of Youth Affairs and Employment, which was created in 1978. At that time, the latter was given responsibility for co-ordinating education and training activities with the needs of the economy and perceived manpower needs. The research done under its aegis has resulted in a proposal to establish a co-ordinating body for all vocational training, and an effort to collect data on the situation has begun. At about the same time as the establishment of this ministry, a government-sponsored study was undertaken which resulted in a White Paper on Proposals for Education Reform, under the Ministry of Education. Similar proposals were made to establish a co-ordinating body for technical and vocational education and training, proposals upon which a committee is now working. The Ministry of Youth Affairs and Employment is awaiting these concrete proposals before proceeding further with its own plans for a co-ordinating body. In Sri Lanka, then, the necessity for closer co-ordination among the agencies involved is certainly recognized but the problem of where to situate such co-ordination in the overall government structure remains to be solved.

Looking at the experience and structures of the sixteen countries as a whole, it can be said that virtually all have some form of policy co-ordination between education and training given outside the educational system, ranging from consultations at ministerial level to shared use of facilities at institutional level, or advisory bodies for education from representatives of professional groups within the communities. The main problem appears to be one of designing ways in which such co-ordination can be formalized at national level so that the various policies do in fact mesh and form a whole. In fact it would appear that, for two reasons, such co-ordination as far as the definition of objectives is concerned would be better done before it is considered by the national planning authorities. The latter cannot possibly be aware of all the implications of any one policy decision for other sectors unless these have been carefully studied beforehand. Secondly,

unless such structures for co-ordinated implementation exist, technical and vocational education and training geared to real manpower and economic needs, and therefore to providing employment and fulfilment for the individual, will remain a dead letter.

## The planning process

The great majority of the countries involved in this study stress the planning process. As noted earlier, planning cannot be separated from the formulation of policy objectives at a higher level. The separation occurs when one looks at planning as the means of achieving these objectives. As can be seen from a study of the structures presented in Chapter 2 and as indicated in the earlier parts of this chapter, the development and expansion of technical and vocational education are for the most part an integral element in national development planning. Once again, the principle is an accepted fact. Once again, the problem is to render it a reality, that is to draw up concrete plans to implement realistic policy objectives. As we have seen, the overall policy formulation and planning agencies are virtually the same in most countries. Another pattern to be found concerns the planning departments or units within the administrative structures responsible for education or training. It can be fairly said that the structures are for the most part in place, as evidenced by the structural diagrams in Chapter 2. The problem seems to lie not so much in lack of structures as in improving their functioning.

One of the problems, and perhaps the major one, inhibiting functioning of sound planning is lack of information. For some countries, the information lacking is very basic: what segments of the population are at school, in what specialities; what segments are at work and where and in what specialities; what segments are unable to find jobs and why; what are the occupations that offer the best opportunities to individuals at present, and in the future, what employment sectors should be developed for the benefit of the community, and for the benefit of individuals; what sectors are developing that require skilled manpower which is at present not available? These are the kinds of questions that challenge the research and information-gathering services and to which answers must be found if realistic policy formulation and planning are to be carried out.

In this connection the Czechoslovak report provided a very sound analysis of the problems facing countries with a long industrial tradition in gathering information for manpower-need projections so as to adjust the educational and training system accordingly. In Czechoslovakia, as in a number of industrialized countries, manpower demand in the primary sector is declining as a result of automation and

other structural changes in the sector. Adjusting education to these changes is not an easy task. Indeed, Czechoslovakia considers this to be one of the most difficult problems in the sphere of technical and vocational education. Research institutes in the field of technical and vocational education are collaborating with research institutes engaged in looking at various sectors of the economy on a long-range basis. This research is designed to isolate various trends with which technical and vocational education may be co-ordinated.

The problem of information seems then to be a crucial one in the policy formulation and planning process. Furthermore, in order that correctives may be applied in a system, there must be some means of evaluating policy objectives and planning. With regard to policy, the following are among the questions which arise. Are these objectives implemented? If not, why not? Are the reasons structural? Do they arise from attitudes that were not foreseen when policy was set? Are the plans realistic? Are they really geared to implementing the policy objectives adopted? The reports indicate that although structures are certainly in place for defining and setting policy objectives in the framework of a national plan of development, the mechanisms of evaluation and feedback which determine the success or failure of these objectives and the efficiency of the planning are either sadly lacking or exist only on an informal basis. Purely quantitative statistics on the yields of various programmes of vocational and technical education and training are now becoming available, as evidenced in a number of the country reports. But there do not on the whole seem to be mechanisms that allow the real significance of these statistics to be 'plugged' back into the whole policy-formulation and planning process. Development of an information base and evaluation, feedback and readjustment in the policy and planning process for technical and vocational education therefore appear to be two priority areas.

Policy and planning are inseparably linked; their separation is in fact purely conventional for the purposes of analysis. Furthermore, this process of evaluation and feedback is closely tied to the way in which technical and vocational education is administered and managed, as will be seen in the following chapter. Figure 18, a chart presented in a paper prepared for the Expert Meeting at Unesco, sums up this relationship and points to the importance of applying management techniques to technical and vocational education.

Few can boast of having achieved such a system on all levels, whether in terms of national development plans, in terms of the administration of technical and vocational education within the education and training systems, so often separated, or even in terms of institutional administration.

In conclusion it may be said that the general policy objectives adopted for technical and vocational education and training cor-

FIG. 18. Educational planning and management process.

respond to national demand and are in line with the factors determining particular national approaches. There remain, however, the problems of implementing these objectives, and these may be briefly summarized as information, co-ordination, and feedback and consequent readjustment. At the same time it must be said that the directions of general policy are obviously in line with the ideals adopted by the international community and that it is evident that a great deal of effort is being expended on developing and expanding technical and vocational education and training in the interests of social and economic development.

# 4 Administration and management

Setting policy objectives and determining the areas of priority in a national plan are essentially political exercises. Whether or not these objectives are met is a question of management and administration. Though management and administration are inseparable, there is a very definite distinction to be made between the two: management is concerned with the output of the system, with its performance, with finding ways to meet the objectives set. Administration, on the other hand, is concerned with input, with directing, organizing and executing the routine operations that keep the system running. Obviously there is nothing for management to do if the administrative organization is non-existent, and conversely an organization operating without management may function but the question is to what end.

In all of the countries dealt with in the present study, administrative structures for education and for technical and vocational education (though in several cases the latter is very young) do exist. In considering how some of these systems of organization work, it is important to bear in mind the issue of whether or not they in fact constitute the channels for implementing the policy objectives agreed upon by the communities.

## Administration: some operational patterns and problems

Neither the space nor the material is available for a detailed discussion of the functioning of the administrative systems for technical and vocational education in all sixteen countries. It would, however, be useful to look at a few systems as examples of how responsibilities are allocated and where functions lie. Ecuador, Ghana and Turkey provide three interesting examples of the situation in developing countries, of what is being done to change and improve the administration and of some of the problems involved. The problems are common to many countries at all stages of development.

*Ecuador*

As shown in the chart and comments on Ecuador to be found on pages 28 and 140, in-school technical and vocational education is administered at national level by a Department of Technical Education within the Ministry of Education. This comes under the authority of the Directorate of Education responsible for the overall administration of public education, and is itself responsible for the organization, execution and evaluation of all programmes in its sector. The establishment of this department is part of the effort now being undertaken in the country to reform education and training so as to respond better to social and economic development needs and objectives. In line with this policy, Ecuador has embarked on a Project for Improving and Expanding Technical and Vocational Education (PROMEET) with aid from the Inter-American Development Bank (IDB) and technical back-up from Unesco. This project, now in its first phase, is designed to find ways in which to co-ordinate the whole technical and vocational education and training effort with real manpower and economic development needs and to overcome present maladjustments between education and the world of work. In this respect, Ecuador has experienced what a number of developing countries have experienced, a phenomenon referred to earlier with regard to Sri Lanka: as general education facilities and school enrolments have been successfully expanded, the school system has produced large numbers of educated young people who have no skills to offer in the employment market. The result is unemployment and an even greater problem of underemployment, while at the same time trained manpower at all levels is lacking for development of the economy. So far, in other words, the school system has failed to produce the technical manpower so badly needed, and the authors of the report point out that one of the main reasons for this is in fact structural: technical and vocational education has been organized and administered on the same centralized hierarchical lines as the secondary-education system in a closed circuit allowing for no co-ordination with manpower-planning structures, with the various economic sectors and employers, or with the training system.

While the performance of the school system leaves much to be desired, SECAP, the national training authority, has proved highly satisfactory. Through its regional administration this agency is responsible for running training centres offering job qualifications in industry, agriculture and commerce. The authors of the report consider that one of the major elements in the success of this programme is the fact that it is decentralized and can therefore offer more flexible responses to changing situations than can the education system as now constituted.

In the light of the research and analysis carried out over recent years, a new organization for technical and vocational education and training is now being devised. According to current thinking, a national council on technical education and training would be headed by the Minister of Education with representatives from enterprises, from the General Directorate of Employment and Human Resources of the Ministry of Labour, from CONADE, the national planning council, from SECAP and from workers' organizations. This council would be responsible for policy-making and planning. Policy would be implemented by an executive unit headed by a director and a co-ordinator and advised by an executive board. The system would consist of units for planning and evaluation of both the system and the curriculum, of a general administrative unit assuring logistical support for the various services, and a decentralized national technical education service supervised by a department at national level but with the primary responsibility for implementing technical and vocational education transferred to regional subdirectorates and the various educational units. This system, while very closely tied to the Ministry of Education, would then be independent of the general education system, in respect of both administration and budget, so as to respond to the special requirements of technical and vocational education.

*Ghana*

In the early 1970s, Ghana reorganized its entire educational administration system so as to do away with anomalies in the structures and in the status of various teaching and administrative staff. The result was the creation of the Ghana Educational Service, whose structure is shown in the diagram on page 30 and which is the executive arm of the Ministry of Education.

Technical and vocational education in Ghana is administered by the Technical and Vocational Education Division of the Ghana Education Service. This division includes nine departments, which together plan and administer the courses given in the twenty-nine special technical and vocational institutions: two technical teacher-training colleges, three polytechnics, seventeen technical/vocational institutions, and seven primary technical schools. The Technical Education Unit is responsible for technician training in the polytechnics and technical courses at secondary level. The Vocational Education Unit organizes vocational courses in technical institutes and vocational training centres and also recommends syllabuses for the various practical courses given in the junior-secondary schools, the new comprehensive schools being introduced into the basic education system. This unit has a co-ordinating function, with the National Vocational Training Institute and other departments offering vocational training for the standardization of qualifications. A unit for

communication and public information, in co-operation with the Manpower, Training and Welfare Division, also determines and helps to meet the needs of institutions for training staff. There is a Staff Development and Teacher Education Unit and another for Equipment Materials and Development. Two other units deal with special syllabuses: the Catering, Fashion and Dressmaking Unit and the Business Education Unit. The Technical Examinations Unit has primary responsibility for preparing, approving and updating curricula, and conducts and administers both local and overseas examinations. A unit has also been set up to act in liaison with industry and assist in determining training needs. It is responsible for preparing educational and occupational guidance materials and arranges industrial training courses for students and teachers alike. It works with the Manpower Division of the Ministry of Finance and Economic Planning, the Department of Labour and the National Vocational Training Institute to identify labour shortages and bring people from industry into the schools to meet with students and teachers. Principals of institutions are administratively responsible to their regional education director, but matters having specifically to do with the development of technical and vocational education are referred to the director in the Technical and Vocational Education Division at headquarters. Technical personnel have also been posted to the nine regional education offices to liaise with technical and vocational education institutions and act as channels of feedback to headquarters.

The structures covering administration of a comprehensive system of technical and vocational education are therefore in place in Ghana. The authors of the report also point out that the number of technical and vocational institutions and training courses now available is adequate to meet needs but that there are a number of problems involved in making the system work. The schools cannot expand their enrolment because of lack of equipment, and there is a great deal of overlap in what is offered by the National Vocational Training Institute and the Ghana Education Service. These, as the authors of the report point out, are problems of management.

*Turkey*

Turkey, as mentioned in the comments on the structural diagram of its policy-making and administrative system, has a highly centralized administrative and educational structure. All technical and vocational education and training, whether formal or informal or within the apprenticeship system, come under the authority of the Minister of Education. Schools run under other ministries, agriculture for example, are bound to follow the programmes and meet the standards set by the Ministry of Education.

As pointed out earlier, three major bodies participate in the policy-

making process. The National Education Congress is the main advisory body for educational policy. The High Advisory Council for Technical and Vocational Education studies and evaluates the overall technical and vocational education system and makes proposals for its improvement and development. This council is composed of representatives of the interested ministries and public agencies, of the universities and of professional organizations. The Apprenticeship Council supervises and evaluates the workings of the apprenticeship system and its development. It is composed of representatives from the General Directorate for Apprenticeship (the responsible agency under the Ministry of Education), from the Ministries of Industry, Labour and Commerce, from the Merchants and Artisans Confederation, from the Union of Chambers of Commerce, and from the major labour union. The Department of Research and Programming under the Deputy Secretary for Technical and Vocational Education is responsible for research projects, although other public and private agencies participate in this effort. The key executive units for the system are the general directorates: for girls' technical education, for boys' technical education and for commercial and tourist trades education. The directors of all formal and non-formal educational institutions are appointed by one of these three general directors.

Here is an example of an administrative structure which covers all areas of technical and vocational education and training, from policy-making to curriculum development and evaluation, from the planning and policy-making level to that of running individual institutions. Yet, as the authors of the report point out, there are a number of problems that have to do with the internal dynamics of the system. The weight of centralization and bureaucracy means that the system is slow to respond to changing needs at local level or to innovation even when experiments have proved successful. Furthermore, the people in the top echelons of administration, even in technical and vocational education, are for the most part academics with no practical experience outside teaching or educational administration. Furthermore, the technical lycées have come to be considered as the stepping stones to university education and so the programmes have become increasingly academic, to the detriment of the practical side. Thus the system is not training the skilled middle-level personnel for whom it was designed, and there are now more demands for entrance than there are places in the schools. Traditional values permeate the system from above and below, meaning that the internal dynamics are not geared to serving the purpose for which the system was designed.

Education–industry co-ordination is also lacking although various agencies and structures have been created for this purpose. The result is that only an estimated 30 to 40 per cent of the young people graduating from vocational schools find employment in the field for

which they are trained, while industry on the other hand lacks qualified skilled and middle-level manpower.

One of the problems is that there is no legal base for the contribution by industry to technical and vocational education; another is the lack of research and information on manpower issues. Research and experimental projects are under way to impart a new dynamic to the system in this particular area. On particular project, OSANOR, being developed in conjunction with the Research Centre of the University of Ankara, is designed to formulate a system whereby educational institutions and industrial enterprises can establish fruitful collaboration by involving industry in the training process both financially and in terms of skill training, by having industry participate in certain decisions regarding technical and vocational education through mixed councils at local level, by adapting programmes in this direction, by finding ways of providing students with practical experience in industry as part of the final year's programme, and by giving credits that are recognized in education for skills and knowledge acquired on the job, thereby creating a more flexible formal education system. This project is now under way in four vocational schools and will be extended to others if positive results are obtained. Again with regard to research and information, the authors of the report note that, despite the information-gathering effort made on the part of several units within the educational system and within the national planning office, the elements which have been identified are not yet applied systematically in evaluating and updating the system. This again is a problem of management.

To sum up, the administrative structures are for the most part in place. In the majority of the countries covered in this study there is a problem of flow. Although the structures are there, they tend to be static, and it is difficult to impart the dynamics required for implementation of technical and vocational education policy. In the first place, there is the problem of two-way flow. Administrative structures are by nature hierarchical, and flow within them tends to be more downwards than upwards, so that the people on the spot are frequently achieving positive results of which the people at the top are unaware. Furthermore, response to needs within a community or region can be faster at institutional or local level. Thus, in Ecuador and Chile, as already observed, there is a conscious plan to hand over more responsibility to local units. Indeed, a trend to decentralization in technical and vocational education may be distinguished throughout Latin America, as evidenced in the final report of the subregional seminar on training of administrators and supervisors in technical and vocational education sponsored by the Unesco Regional Office for Education in Latin America and the Caribbean and held in Montevideo in the autumn

of 1982. Turkey is also attempting to transfer more responsibility to local units, particularly in relation to co-ordination with industry. On the other hand, a proper balance must be struck: there must be a certain amount of authority at the top if the system is to fulfil national policy objectives. Lesotho, for instance, is aiming at more government control of the separate and mostly private institutions offering technical and vocational education and training along the lines adopted in Algeria, Gambia and Sudan, where, given its priority in national policy, technical and vocational education, as distinct from the general education system, comes directly under the government.

Virtually all the countries have forms of liaison with out-of-school training through a unit or department within the system, but most state that these are not yet fully operational.

In short, where technical and vocational education systems are separate from training systems there is often overlap and duplication of effort and therefore wastage of precious resources. Similarly, provision is made for linkage with the various occupational sectors in terms of practical training for technical and vocational education students within the school system and for prospective or in-service teachers, but again there are many shortfalls in this area. The situation is particularly serious with regard to teacher training, as many of the reports underline. It is difficult to attract people into the teaching profession from industry because of salary differences, so technical teachers in many countries are recruited directly from secondary technical education into the teacher-training courses. On completion of these, they return to the school system with virtually no practical experience in industrial, agricultural or commercial employment. This has two major effects which tend to perpetuate maladjustments between education and the world of work. First, the teacher is not prepared to introduce the students to occupational reality, with the result that upon graduation they are ill-prepared for employment in terms both of attitude and skills. Secondly, and a most important point in the context of the present study, most administrators in technical and vocational education are drawn from the teaching profession. Hence, top policy-making and executive levels are often not attuned to the realities of economics and employment.

Finally, as regards the supervision and evaluation of programmes, facilities and equipment, and teaching effectiveness, although administrative provision has been made, the system appears everywhere to be relatively closed, because in technical and vocational education effective criteria can be set only by looking outside the educational system to the world of work, that is by co-operating with the businesses and industries that hire the graduates and by following up on the graduates of the system. A simple example illustrates the special complexities of supervision and evaluation of technical and vocational education.

Within general education, reading ability and comprehension are a fundamental objective, and student performance in this regard can easily be tested, as can the quality of the teaching. The criteria arise from within the educational system itself, and obviously the student will be called upon to apply this skill throughout his life. In technical and vocational education a student can certainly be taught and tested—on a machine operation, for example—and teaching effectiveness can be evaluated. But whether or not the student will be called upon to use this skill on leaving school is another question entirely. If he is not called upon to use it, then the criteria for evaluating his performance, while valid in terms of the operation, must be considered completely irrelevant.

The basic problem then is to impart a dynamic to the structures for policy implementation and administration—an internal dynamic in terms of the optimization and functioning of the system that is linked to the dynamics of the external but contiguous systems with which technical and vocational education must be co-ordinated if it is to serve the purpose for which it was designed. This is what management is about.

## Management techniques in technical and vocational education: the potential

Management science is relatively new but has made great strides in its applications in business and industry and in other sectors. This science is directed to rationalizing decisions, optimizing resource allocation and utilization and to improving the yield and efficiency of any given system. In recent years it has begun to be applied to educational systems. It is evident, however, given the fact that the education system produces people and not goods and services, that although such techniques hold great potential for improving educational systems, they must be carefully adapted to the special and very human process that is education. In a word, computers can help with the details, but men and women have to find the answers.

Investigation into the applications of management science to the educational process is relatively recent. Of the sixteen countries reporting for this study only Australia specifically mentioned a conscious attempt to apply management techniques to technical and vocational education. However, in view of the complexities of technical and vocational education, the role it is called upon to play in the development process, and all the factors involved in its effective administration, it would seem to lend itself, perhaps more so than other educational sectors, to such an approach.

Here it may be useful to go into more detail concerning the distinction between management and administration that was touched on at the beginning of this chapter. In this respect, the paper prepared for the Unesco Expert Meeting by Dr K. Gopalan, Deputy Educational Adviser (Technical) to the Government of India, Ministry of Education and Culture, provides very useful definitions:

> Management is the specific instrument of an enterprise used to achieve positive end results. It is a social process designed to ensure the co-operation, participation, intervention and involvement of people—people inside and outside the enterprise—in the effective achievement of given or predetermined objectives and goals. Where precise descriptive goals and measurable objectives have not been set and powerful management aids are not being used, administration rather than management exists. Administration is input oriented, management is output oriented. Administration, which is but one function of management, pertains to directing, organizing and executing. Management is involved not only in administration, but also in planning and leadership. In short, the success or failure of an enterprise depends almost entirely on the functional responsibilities of management.

It is generally accepted that the management process consists of four stages: planning, organization, direction and control. At each of these four stages, several functions come into play, among the most important being: decision-making on the basis of alternative courses of action, problem-solving, human relations and communications so that the people involved are convinced of the validity of the course of action and actively participate in carrying it out, and finally information, the most essential ingredient for managerial effectiveness. These components of the managerial process are summed up in Figure 19.

As may be seen from the diagram, information is at the heart of the matter; and with specific reference to technical and vocational education, it has already been noted that countries are very well aware that their information base leaves much to desired, whether in terms of planning and policy-making or of evaluating the real effectiveness of the system.

What are some of the management tools and techniques that can be applied in technical and vocational education? These may be briefly considered with very summary indications, because although research is being done on them and they are being applied in a number of economic sectors, their application in the field of education has only begun in the last few years, and the vast majority of educators and administrators in most countries are not yet familiar with them.

The Delphi technique is a method of assessing opinions by having individuals in various groups respond to a series of questionnaires. These responses can then be analysed and made to supply a more objective basis for determining opinion trends than do group meetings

FIG. 19. Basic components of the managerial process.

from which a vague 'sense of the meeting' emerges. The technique is useful in relatively long-term planning because it is a means of assessing the range of ideas concerning goals and objectives and so of setting them. But is not very helpful for the immediate decisions that have to be made. Applications of this technique could be envisaged at all levels of technical and vocational education from the major policy-making and planning agencies—a national council of technical and vocational education for example, with representatives from all interested sectors—to faculty meetings at institutional level with representatives from local industry and commerce invited to participate.

PERT (Programme Evaluation and Review Technique), or the Critical Path Method, can be useful in implementing the objectives set. PERT is a probability system designed to optimize resources and save time and money by constructing a network visualizing the plans adopted to reach certain goals, the interrelationships and interdependencies of the programme elements and priorities accorded to the elements of the plan. With this information the shortest, or rather most efficient, path to the goal may be traced. This technique could be adapted to the macrolevel or microlevel in technical and vocational education, to an analysis of how to implement co-ordination between a formal education system and an independent training system, or to a local project for a multipurpose training centre.

PPBS, or Planning, Programming, Budgeting System, provides a

method for determining the cost of programme goals and objectives. This system is geared to assisting the manager in determining the costs of programme goals and objectives and to making the best possible use of available resources through budgeting for an entire programme rather than on an on-line basis. In technical and vocational education, it could be usefully applied in making decisions as to allocation of scarce resources for priority programmes and deciding what is and is not feasible in the immediate future.

Operation Research (OR) is an aid to analysing and evaluating means for implementing a programme before the actual steps are taken. It is a technique which helps to analyse a problem and develop alternative solutions, and is essentially a tool for information and information-processing. On the basis of systematic, mathematic analysis, the result of a course of action can be simulated. Again, this would be a very useful tool in deciding how a policy might be implemented in technical and vocational education, a prerequisite naturally being to gather the appropriate information.

MIS, or Management Information System, is an organized method of providing management with the information it needs for decision-making. Basically, MIS seeks to integrate the above procedures into a total information system upon which to base policy implementation.

Management by Objectives (MBO) entails measuring concrete achievements in the process of determining objectives and goals. This is not simply a matter of applying a set of rules. All those involved in implementation are also involved in setting the objectives and in the evaluation process. The method can lead to very tangible results in education, which basically depends on the interaction of people. Such a method might, for example, be very usefully applied in technical and vocational education and training in those units at local level which are or will be called upon to assume ever greater responsibility.

Many of these modern management techniques cannot be applied without computers, which are therefore essential to the adaptation of those techniques to education management. This is not an insurmountable barrier by any manner of means, given the proliferation of models adapted to all ranges of needs, from enormous government or industrial programmes to the small business and home computer.

Such techniques would seem to hold a very large potential for technical and vocational education, given the number of factors that must enter into the design and implementation of a viable system. What is absolutely vital, however, is an information base upon which to build these techniques. It is this base that in many cases is lacking. Even where efforts have been made, the means do not seem to exist for applying the information so as to define and attain objectives. Only with the appropriate information can a system be evaluated and new objectives set, and the means have to be found for feeding the results of

research back into the system. This again is a management problem.

With a sound information base, it is possible to set policy objectives at every level that are more realistic and hence have a better chance of being achieved. Working from this basis, management techniques may be applied in programming to meet the objectives adopted. Resources may be better analysed and budgets established accordingly. Such techniques, moreover, can be applied to problems of evaluation and follow-up. Information-gathering and the application of management techniques are inseparable. As one example, educational management takes account of the fact that there is significant wastage in the technical and vocational education system. The obvious question is, why? To find the answer, information may be gathered as to why students repeat and why they drop out. Factors extraneous to technical and vocational education can be identified, for example the lack of appropriate general education, problems of families who simply cannot afford to continue sending their children to school, etc. These results may be passed on to the concerned agencies and authorities. On the other hand, such factors as lack of motivation because of lack of employment opportunities after graduation, or inappropriate teaching methods and materials may be identified and to some extent quantified and hence made easier to deal with. With such factors identified, management might be led to ask such questions as, do our graduates in fact find work? If not, why not? And if yes, is employment available in the fields for which they trained? With elements of the answers to these questions, management can begin setting new objectives and programming to meet them, since it is management's job to feed the results of research back into the system for application.

The country reports amply demonstrate that the application of management techniques in technical and vocational education has been limited. Only one report, from South Australia, specifically mentioned efforts to develop these techniques, and this only in the last two years. Yet it is certainly a field that merits the closest attention from technical and vocational education policy-makers, planners, administrators and educators in view of its potential for dealing with some of the complexities and the numerous factors involved in this form of education and training.

The greatest barrier to developing management science as related to technical and vocational education and actually applying it is the lack of trained management staff. It would be very difficult indeed to attract and keep trained managers from industry and business. Undoubtedly the soundest approach would consist of an all-out effort to train technical and vocational education teachers and administrators in this field as part of their overall career development programme, and this in co-operation with business and industry and training authorities outside the education system.

The question of career development for administrators is a vital one. Most of them come from the teaching profession. This is highly desirable in that it offers possibilities of career development for technical and vocational educators, but there are drawbacks, given the special character of technical and vocational education and the links it should have with the very real world of work. Some countries, as already noted, point out that when teachers pass virtually their entire careers solely in education, this can be a block to innovation in the system and to opening it up to meet new development needs and the manpower needs of business and industry. This is all the more true of those teachers who become administrators. Thus, it is not only vital for teachers and therefore future administrators to pass a considerable amount of time in employment on a periodical basis, and this from the very earliest stages of their training, but special training must also be designed to prepare administrators and to keep them up to date through lifelong programmes. A very important element of such programmes could and should be the theory and above all practice of management science as applied to technical and vocational education. Programmes, in fact, could be designed to bring together technical and vocational teachers and administrators and people from business and industry for management training courses, thus forging stronger professional and personal links between education and work. Through such career systems, moreover, better opportunities could be made available to technical and vocational teachers, thus attracting more highly motivated people into the profession.

That developing countries are highly aware of the problem of training knowledgeable and competent administrators, is evidenced by the previously mentioned regional seminar held under the sponsorship of Unesco, through its Regional Office for the Latin American and Caribbean States.

This meeting made a number of recommendations: for more widespread distribution of the Revised Recommendation, for better co-ordination among the various international organizations concerned with technical and vocational education and better horizontal exchange of information at regional level, for better relations between technical and vocational education and training, on the one hand, and planning organisms on the other, for better co-ordination and relations with the world of work at national and local level, for development of continuing technical and vocational education and teacher training, both qualitatively and quantitatively, for strengthening vocational guidance and for standardizing terminology. The meeting also made a number of recommendations for improving initial and continuing technical teacher training, but it was specifically concerned with questions of administrative personnel, particularly training, which although a matter of concern in theory has not up to now been

the object of concrete action. Participants were particularly preoccupied by the problems of personnel in marginal urban areas and in rural areas. As a result of the deliberations and the conclusions reached, the meeting made a number of recommendations, which may be summed up as follows:

To promote use of planning techniques at grassroots level.

To co-ordinate activities with staff from other sectors engaged in technical and vocational education and training through the organisms responsible for training supervisors and administrators.

To systematize and disseminate experience of defining and developing the competencies required of administrative and supervisory staff.

To promote research into the requirements for this staff, particularly in marginal urban and rural areas.

To promote training for staff operating in disadvantaged areas.

To improve training curricula for teachers operating in these areas.

To promote specialized meetings on these issues through the international organizations operating in the countries concerned.

Administrative structures for technical and vocational education have a long history, tied for the most part to the development and traditions of educational structures as a whole. As previously observed, appropriate structures, corresponding to the scale and administrative traditions of the various countries, are for the most part in place, with the possible exception of overall co-ordinating bodies, which are, however, being set up or projected in many places. Some structural provision might also be rethought in terms of imparting greater flexibility to the system together with the ability to respond quickly to changing circumstances. It has likewise been observed that, particularly in the Latin American countries, there is a trend towards some degree of decentralization so as to delegate more responsibility to regional and local agencies which are in far closer contact with the 'field'.

The major problem is their dynamics or lack thereof, and particularly as regards the framework for closer co-operation between education, training and work at all levels. A solution may well lie in applying appropriate management techniques so as to set realistic objectives for performance, to provide the means for continuous evaluation and consequent adjustments—that is, a feedback system—and to use available resources to the maximum extent, at all levels from that of individual institutions to that of top policy-making and planning. This presupposes a prior and continuous effort to gather and process the information necessary for its application and a major training effort directed to the educators and administrators, policy-makers and planners responsible for implementation.

# 5 Financing and cost-effectiveness

Lack of funds to finance technical and vocational education is undoubtedly the most serious constraint to its development and expansion. This is a recurring theme in most of the reports. Here a number of very complex problems are involved. Very generally speaking, they may be said to fall under three heads: sheer lack of money; a social demand for general education rather than technical and vocational education; and the relative cost of technical and vocational education in comparison with other types of education. Because of low levels of economic development, many developing countries simply do not have available the means of financing technical and vocational education on a broad scale since other priorities are making demands on their very limited resources.

In quite a number of countries at various levels of development there is a tendency to put a greater proportion of the resources available for education into general or purely scientific education as a result of social demand. The usual result is, of course, under-employment and unemployment among school-leavers, since there are simply not enough white-collar jobs, while the economy goes begging for trained personnel to stimulate and implement its development. Finally, technical and vocational education is simply more expensive than other fields of education because of the facilities and equipment required.

A closer look at the experience of the countries involved in this study will show how these general problems are reflected in particular experiences and will perhaps give some insight into what might be done to overcome them.

In all sixteen countries, the major source of finance for technical and vocational education comes from public funds, although finance for capital investment in some developing countries may come from external sources. This public financing may be from a central budget at national level or primary from local and regional government education budgets or some combination of the two. In Algeria, Argentina, Ghana, Ireland, Sri Lanka and Turkey, for example,

between 90 and 100 per cent of the funds for technical and vocational education come from the national education budget. In Australia and Czechoslovakia, while it is all publicly funded, the financial burden is shared between the national and the state governments. In Australia 39 per cent of the funds are provided by the federal government and 61 per cent by the state governments; in Czechoslovakia higher education is financed directly by the state (17 per cent of the total education budget), while the regional and local committees are responsible for 67 per cent of the financing and national enterprises contribute 16 per cent for the training activities involved. In India the various states are responsible for all recurrent and a considerable proportion of capital expenditure, while the central government may release bulk grants for capital outlays or special programmes. In terms of private financing, the Netherlands is a special case, as most of the schools are denominational. While these institutions are responsible for capital outlay, the government meets teachers' salaries and other recurrent costs for those schools accredited by it and therefore included in the school plan. In Lesotho, representative of the least-developed countries, the sources of funds for education are tripartite, with from 75 to 80 per cent of the budget being financed from public funds and from 15 to 20 per cent from private sources (churches, school fees, etc.) combined with a considerable amount of external aid for development projects, most of which revolve around vocational education and training, particularly in the rural areas.

The country reports, then, reveal that technical and vocational education is financed for the most part from public funds, whether at national, state or local level, and that these funds are most often integrated into overall education budgets. Here a problem may arise, as underlined in the report from Ghana: with funding of technical and vocational education an integral part of educational financing as a whole, the stated priorities for technical and vocational education can sometimes be 'overshadowed'. The extent of this problem will become clearer in the discussion below concerning the percentage of the national education budgets and of the secondary-school budgets devoted to technical and vocational education. A second point should be noted, namely that a number of the countries observed that the education budgets for which they could give figures in the reports obviously did not include sources of finance for training programmes which might be run by other public agencies (ministries of agriculture, industry or labour for example). Indeed, it is obvious from the reports that it is very difficult to identify in detail the sources of finance for technical and vocational education and training as a whole in any one country, given the number of agencies involved.

A final observation should be made as to sources of finance: in terms of technical and vocational education within the formal

education system or under its aegis (non-formal programmes using school facilities and staff from the formal system), the final 'user' of the 'product' is very little involved in the financing. The one exception in this respect is Czechoslovakia. By reason of the country's political and economic organization, industry is expected to contribute to a significant degree to the financing of education (16 per cent). This is public financing, but the point is that the future 'user' is contributing to the educational output. The problem in many countries is the old dichotomy between education and training. The various economic sectors are willing to put out money for training, but training to very specific ends. The people in education have as their objective an ideal education in a broader sense. The result in technical and vocational education is often a very costly output that is not immediately employable in industry, commerce or agriculture. Since the overall objectives of any country or society converge in this domain, it is in the interest of all concerned, and certainly in the interest of the young people who are any country's major resource, that all should contribute to their realization. Future employers are very often absent from the list of 'patrons' of technical and vocational education, whereas they should be among the foremost. There is reticence on both sides because of immediate objectives that could be qualified as short term, or perhaps, more accurately, near sighted. There are possibilities for new and flexible sources of financing technical and vocational education by conjugating the interests of all and the efforts made on each side. Certainly an awareness exists that future employers should be involved in the planning and policy-making process, as demonstrated by the steps taken in a number of countries to set up a special agency responsible for in- and out-of-school technical and vocational education and training. A further step has to be taken in order to provide employers in various sectors with incentives to contribute in a concrete fashion to the realization of the objectives. Australia, for instance, along with other countries, provides tax incentives to employers who participate in apprenticeship-training schemes, many of which include study within the educational system. The Latin American countries are attempting to decentralize their systems of technical and vocational education in order to link them more closely with what have proved to be successful training schemes, but schemes that need a broader dimension. This was one of the main themes of the previously mentioned seminar held for administrators from Latin American and the Caribbean countries. In conclusion, whether publicly or privately run, enterprises should be a source of funds for financing technical and vocational education, in terms of capital investment, or programme operation, or equipment supply. In return they should be involved in defining policy objectives and the planning process.

A very clear indication of the importance accorded technical and vocational education is to be found in the proportion of the national budget for education consecrated to this field. The figures given in the reports vary considerably. Seven of the sixteen reports gave figures in this regard and these ranged from 3.2 to 33 per cent. Here, as elsewhere in this chapter, a caveat should be issued: the bases for calculation vary so greatly from country to country that a comparative estimate is very difficult if not impossible to establish. In these pages figures are given simply to provide the reader with an idea of the proportion or scale. The following figures summarize the information available on the percentages of the overall education budgets devoted to technical and vocational education: Australia, 10; Chile, 6.1 to 10; Czechoslovakia, 33; Ecuador, 3.2; Ghana, 4.5; Sri Lanka, 9 (plus private sector); Sudan, 48.24; Turkey, 11.3.

What these figures do not show is that in a number of countries, according to their reports, the proportion of the national budget devoted to education as a whole has declined, as has that for technical and vocational education. There are, of course, a number of factors contributing to this, made up of a combination of other urgent priorities and a limitation on resources imposed by the general situation in a number of countries. What is evident is that if the resources are to be made available to implement the educational objectives stated in the majority of countries, a greater percentage of the education budget must be devoted to technical and vocational education, or the stated priorities will remain a dead letter.

The basis for technical and vocational education in most countries may be found at the level of secondary schooling. Great strides have been made in the development of post-secondary technical education to train middle-level technical manpower, but this type of education is in fact addressed to an élite. Recruitment at this level is often from the general-education streams and not from secondary technical and vocational education. The basic problem for a large number of countries is to offer education at secondary level that provides entry-level skills should a student leave the system and also lays down the foundations for further study should he or she be so motivated. In this respect, and again given the stated priorities of a number of countries, it is interesting to compare the outlays, both capital and recurrent, for technical and vocational education as related to secondary education as a whole.

Because the data bases differ, it is difficult to compare the ratios between expenditure on technical and vocational education at secondary level and total expenditure at secondary level. Only five countries provided information useful for calculating such ratios and these ranged from 9.4 to 81 per cent, the latter being an exception. From a reading of the country reports and the figures presented, it is evident that hard calculations of what is actually spent on technical and

vocational education in relation to the stated objectives of secondary education have not been made. Despite expressions of intent, budgetary provision has not been made to expand technical and vocational education on the scale foreseen in many plans.

Expenses or costs in technical and vocational education, as in any other form of activity, have to be broken down into capital and recurrent costs. Here the figures and the analyses of the problems are more revealing. Briefly put, the level of capital investments falls far below the level of current costs and it is evident that most countries are struggling with the problem of simply keeping the present system running, and that capital investment is inadequate to meet the objectives set. Two different problems are involved: the breakdown of recurrent costs and the relative amounts of capital injected to develop and expand technical and vocational education.

Recurrent costs, as will be seen later, are not on the same scale as capital costs or outlays per annum. Table 1 shows the allocations of recurrent expenditure or costs for those countries where the information is available.

TABLE 1. Breakdown of recurrent costs in technical and vocational education (in percentages)

| Country | Salaries and wages | Maintenance, utilities, teaching materials and other |
|---|---|---|
| Algeria | 88.7 | 11.3 |
| Argentina | 82.0 | 18.0 |
| Chile | 56.23 | 43.77 |
| Czechoslovakia | 56.8 | 27.2 |
| Ghana | 80.0 | 20.0 |
| India | 85.0 | 15.0 |
| Ireland | 60.6 | 39.4 |
| Sudan | 36.1 | 63.9 |
| Turkey | 70–80 | 20–30 |

As may be seen from the table, salaries, for the most part teachers' salaries, are the largest item of current expense with the exception of Sudan. And yet one of the problems incessantly referred to is the lack of qualified teachers and those who are qualified often are more expensive than other teachers. The Sudan report estimated for example that technical teachers cost one-third more than academic teachers. Here the system seems to be out of focus. That teachers' and administrators' salaries account for the greater part of current expense is normal. But that this item should account for 80 to 90 per cent of a budget, given the requirements for teaching materials, production materials, maintenance, etc., is not normal if technical and vocational education is to achieve the objectives assigned it. As the Indian report pointed out,

the proportionately high expenditure on salaries leaves little over for anything else.

The ratio of recurrent expenditure to capital expenditure is another important indicator of the financial efforts actually made to implement technical and vocational education. This figure may be given for the following countries: Argentina, 7.3 : 1; Chile, 1.6 : 1; Czechoslovakia, 12.3 : 1; Ghana, 3 : 1; Sri Lanka, 3.8 : 1. It should be noted that the figure for Chile relates to industrial education only and was derived from a study of real costs of this stream for one year. In more general terms it was observed that teachers' salaries alone were equal to capital outlay for the year. With regard to the highest of the ratios (Czechoslovakia), given the long-standing emphasis in that country on technical and vocational education and hence the infrastructure financed by both education and industry, it is not surprising that recurrent expenditure is much higher than capital outlay. As for the other countries, the figures reflect a major problem confronting many developing countries: the necessary capital outlays for building and equipping technical and vocational education installations are not being made. Indeed the report from Sri Lanka explicitly stated that the 3 : 1 figure (1980) is far too high and that a real effort is now being made to invest in order to bring it down to a 1 : 0.9 ratio in the near future. The figure for Ghana represents the situation in 1979–80. The report noted that the ratio was considerably lower three years before (1 : 1.8 in 1976–77), indicating the problem of steeply rising recurrent costs, and therefore expenditure, to the detriment of capital investment. Finally, although comparable figures on the situation in Turkey are not available, the report clearly stated that lack of investment is the major brake on the expansion of technical and vocational education in that country.

The above figures and comments indicate how technical and vocational education is financed in a cross-section of countries and how the budgets for expenditure are proportioned both in relation to the overall education budget and within the budget for technical and vocational education. But what does technical and vocational education really cost? Again the figures are not complete for all of the countries and again those that are available can only be given on an indicative basis in terms of comparability.

The following figures give the ratio between unit costs of general secondary education and those of technical and vocational education: Chile, 1 : 1.43; Ecuador, 1 : 0.7 (per student enrolled in one year), 1 : 1.2 (per student graduated); Ireland, 1 : 1.2 (general education), 1 : 1.1 (comprehensive); Lesotho, 1 : 1.5 (recurrent costs only); Turkey, 1 : 7 (investment), 1 : 2–3 (recurrent). Several conclusions may be drawn from these figures, bearing in mind that the bases for calculation presented in the reports varied greatly. First and most obviously, it

costs more to offer technical and vocational education to a student than to offer general education. And this observation leaves aside the question of whether or not costs would be much higher were the adequate facilities to be provided, that is it leaves aside costs of the quality of technical and vocational education. Here the figures from Turkey are enlightening, and are very likely applicable to a number of developing countries. Secondly, attention should be drawn to the figures from Ecuador. Two calculations were made for the year 1978 on the basis of what was actually spent. When the costs per student enrolled for that year were calculated, technical and vocational education was shown to cost only 70 per cent of what general secondary education cost. When, on the other hand, the unit cost was calculated on the basis of cost per graduate, including the number of years it takes to produce a graduate in the equation, the figure was quite different, the cost being 20 per cent more. The reason for this difference, according to the authors of the report, is to be found in agricultural education, where wastage is most prevalent through dropping out and repeating. Cost breakdowns such as these give an insight into some of the concrete problems that must be overcome to expand technical and vocational education and to make it more efficient.

This raises the question of cost efficiency and cost/benefit analysis. From the information provided in the reports and the statements made by the various authors, it is obvious that for the majority of these countries application of this type of economic analysis is only in the earliest stages, and for many there is no more than a recognition of its possible usefulness.

In Chile, cost-benefit analysis has been applied to a comparison of the performance of industrial education within the formal system and that of training outside the system, the conclusion being that, in the short term, training was more efficient. In Czechoslovakia cost-benefit analysis has been applied to the return on technical education in industry and on university education. An average tenfold return was found (eightfold for technical education; twentyfold for university education). Research is under way for an analysis of vocational education.

What can economic analysis do for technical and vocational education? The answer is that it can provide the planner and administrator with a basis for resource allocation to achieve the maximum with the amount of money available, with data for evaluating the effectiveness of a programme so as to determine whether it has met its stated objectives, whether it should be emphasized over another programme or should be changed or terminated. It is an aid to defining accountability, to measuring efficiency, to resource allocation and to evaluation. It is a tool for identifying areas of performance and problem

areas so that better decisions may be made as to the correctives that should be brought to bear. What it does not do is to tell the administrator or planner how to implement these decisions. It simply helps him choose among alternatives. This in itself would be an enormous aid in decision-making with regard to technical and vocational education.

The theoretical tools are certainly available to engage in economic analysis as applied to technical and vocational education. Cost-benefit studies, for example, have been made. But, as W. W. Stevenson pointed out in his paper for the 1982 meeting already mentioned, these often have very little impact on technical and vocational education programming, for two main reasons. In the first place, the economists tend to use a jargon that is unfamiliar to technical and vocational education administrators and planners; and secondly, the planners and administrators responsible for implementing the programmes are often not involved in the studies: these are rather undertaken by researchers and remain a theoretical exercise. Stevenson argues that this need not be the case; the objectives of such analyses can be stated in terms understandable to the responsible executive and the planners and administrators, who can and should be involved in the information-gathering and analytic process. In fact they must be, for the analysis, whether in terms of cost benefit or in terms of cost effectiveness, must be done as measured against expected outcome. It is the planners and administrators in fact who define the objectives to be reached, that is, the outcome.

This is the heart of the matter. How are costs to be determined and how are benefits in education to be determined? The exercise is obviously much easier for an industrial product. Costs can be determined in a number of very sophisticated ways. But they can also be determined quite pragmatically and in a very straightforward manner in terms of money spent. The real problem in education is to measure benefits. But benefits for whom? For the individual in terms of employment, salary level or job satisfaction? Benefits to industry in terms of finding the qualified manpower needed? Benefits to society in terms of a high level of employment, productivity and cohesion on the part of the work force? All of these enter into the calculations but as Stevenson asked, 'Can we quantify faith?' Determination of the benefits is thus a matter of judgement and in fact these, that is, the expected outcome, have to be stated from the beginning. But because this outcome is consciously related to the probable costs involved and to the resources available, it can be set in much more realistic terms. Upon reviewing the reports, the usefulness of such an approach is evident. Many plans for expanding technical and vocational education were not implemented because of a lack of proportion between desired outcomes and the outcomes that could be reasonably expected given the resources available. The whole object of cost-benefit analysis and of cost-

effectiveness analysis is to improve efficiency and thus maximize the resources at hand. And since such economic analysis is simply a tool, this can be done on microlevel or institutional or macrolevel.

Again the question arises of who is to carry out such an analysis. This in turn raises the problem of the training of planners and administrators who are also called upon to be responsible for financial management. Available information suggests that little has so far been done to initiate those responsible for technical and vocational education into the use of the tools of economic analysis. The problem is very much more than a simple accounting for revenues and expenditure. There is the problem of bringing the economists and the educationists together and establishing a common ground so that they can communicate. This is all the more necessary in technical and vocational education in that the economy, particularly in terms of its development, and this type of education exist in a synergetic and even symbiotic relation—a relationship that considerably complicates the design and implementation of technical and vocational education. As in planning and administration, the issue of staff training arises. Very little seems to have been done so far in the field of training financial management for technical and vocational education.

Before concluding this chapter, consideration must be given to one of the major problems evoked in the majority of the reports from developing countries: that of financing the acquisition and maintenance of equipment. The question of equipment has an incidence on both capital costs and the efficiency of technical and vocational education. Furniture and equipment for technical and vocational education represent the major cost for developing countries. Algeria, for example, calculates that equipment costs represent 66 per cent of capital costs in the construction of a new educational installation, while Sudan estimates these at only 25 per cent. A comparative figure for a relatively developed country in industrial terms comes from Ireland, where the proportion is 25 per cent. The reports from Gambia and Ghana gave great emphasis to this question, which is a priority consideration for a number of developing countries. In these, the equipment cannot be supplied from the local market, while materials for building construction can. The result is that precious foreign currency must be spent for capital investment. Nor does the problem end here. Equipment has to be maintained, and if spare parts cannot be found locally considerable time and money are expended in obtaining them elsewhere, the money coming out of recurrent or operating expenses. Given the limited proportions of budgets that can be devoted to this item because of the costs of teaching and administrative staff, the equipment is often not adequate for the educational needs of those already enrolled in technical and vocational education and certainly cannot cater to requirements should enrolments be expanded. Confronted with this problem,

developing countries are seeking to maximize the resources for practical training that they are creating. Sale of products from school workshops is one means. But according to the reports this is of virtually no significance in meeting costs, not to mention financing. Workshop production is used to aid in equipping the schools, or the proceeds of sales are used to help students meet their fees. It also has pedagogical value. These benefits, though small, should certainly not be neglected. A much broader programme to be found in several countries consists of designing facilities for the training component of technical and vocational education as a central facility serving a number of institutions. Indeed, in a number of reports mention is made of using school facilities for out-of-school informal training programmes. There is also a solution in terms of capital investment which consists of creating facilities serving a number of education and training institutions. A description of this approach in fact formed the major thrust of the report from Indonesia.

In the early 1970s Indonesia embarked upon a programme of providing training facilities for a number of feeder schools. Nine technical training centres were constructed as a part of World Bank projects. These centres serve the senior secondary technical schools. The projects naturally involved not only building and equipping the centres but also teacher training and administrative and maintenance costs. This approach has proved a good way of maximizing facilities and therefore lowering their cost. The Indonesian approach is certainly worth the attention of developing countries seeking to lower their unit capital investment costs as well as costs of equipment maintenance.

Looking at costs and financing of technical and vocational education in the light of the experience of the sixteen countries involved in this study, several general conclusions may be drawn. In terms of sources of financing, the public authorities, whether national or local, play the preponderant role. In terms of capital investment for the developing countries, equipment is the largest item because this must for the most part be imported. Indeed, for development projects most developing countries look to outside aid, either bilateral or through international funding and technical assistance agencies: the World Bank, the Asian Development Bank, Unesco, ILO, the Islamic Bank, the African Development Bank and other regional development funding sources. There are, it would seem, two very specific problems to solve, one in terms of capital outlay, the other in terms of recurrent costs. As regards capital outlay for technical and vocational education, the resources accorded have little common measure with stated national priorities. In fact, in some countries, while the objectives assigned to technical and vocational education have become more important, the resources allocated, both in relative and absolute terms, have in a number of instances declined. As regards capital costs, there

is a major problem in that equipment in many cases must be imported, which means that there is a drain on national budget allocations. Furthermore, the resources allocated to technical and vocational education for capital investment are simply not realistic in terms of what is really needed to stimulate 'take-off'. In terms of recurrent costs, as we have seen, teachers' and administrators' salaries make up the vast bulk of these expenses, to the detriment of equipment, consumable training materials and building maintenance as well as to the detriment of capital investment. Unit costs for technical and vocational education are on the whole much larger than those for general education at the same level.

Steps have certainly been taken to solve these problems, such as maximization of training facilities, and therefore achieving lower building and equipment costs, through offering common training facilities to several feeder schools. Furthermore, a number of developing countries have called on external aid for financing technical and vocational education projects. These, however, have to be carefully designed so that the return will enable debts to be repaid.

Recurrent costs must obviously be reduced. Since salaries cannot be cut, it is a question of rendering the system more efficient and, above all, of finding the means to prevent wastage through repetition and dropping-out and of applying appropriate financial management techniques.

There are a number of tools available to aid in better allocation of resources and in more efficient use of these, among them the tools provided by economic analysis. To use these tools, however, an enormous training effort must be undertaken for managers and administrators at all levels. And the major concern in respect of this training is not so much how to determine real costs, though this is certainly a complex problem, but above all a matter of setting realistic outcomes against which these costs can be measured.

Financing of technical and vocational education is certainly not easy, particularly in developing countries, since there the alternatives are limited by the hard facts of the resources available. The bases for decision-making in respect of their allocation must be found, and the decisions involved, as witnessed by the experience of the countries studied, are very far from easy.

# 6 Development problems and future trends

There is very little disagreement concerning general policy objectives for technical and vocational education. As already observed, all of the countries involved in the present study are very sharply aware of the need to develop and improve their systems of technical and vocational education so that these contribute to economic and social development. The reports indicate a real concern with rendering educational systems more flexible so as to offer greater opportunity to all, while linking education at all levels more closely to the world of work and so making them more relevant and open. The problem is how this is to be achieved. Sound planning and good management are at the heart of the solutions. Without them, the stated policies will simply gather dust in the public archives.

On the basis of the country reports, as well as of the deliberations of the International Experts Meeting, a number of problems common to many countries in this field can be identified. These are the problems which must be overcome if development is to proceed at a rapid rate. They may be grouped under six general headings: (a) social demand; (b) resource allocation and optimization; (c) relevance to development and manpower needs; (d) co-ordination with training agencies and 'product' users; (e) techniques of plan and policy implementation (i.e. management); and (f) lack of trained administrative and financial managers.

Social demand for general education and the white-collar jobs to which it leads far outstrips that for technical and vocational education and the jobs to which it leads. This statement summarizes a recurring theme in most of the reports. As previously noted, a number of countries in the 1970s, among them Algeria, Turkey and Sudan, embarked upon programmes to upgrade upper-secondary technical and vocational education so that it would give access to higher studies. The result has been the incorporation of technical education into the traditional system of educational values, with students enrolled and teachers trained with a view to university entrance. Those who do not complete the course are not employable, and those not accepted in the technical

education stream in the first place have very few prospects for any kind of further education. The report from Turkey dealt with this point in some detail, pointing out that secondary technical education facilities could not meet the demand and that a very large proportion of young people left the education system with no qualifications whatsoever and little possibility of acquiring them, given the limited extent of apprenticeship schemes.

It is ironic, therefore, that development of secondary education in terms of sheer enrolments, whether in technical education or in general education (as for example in Sri Lanka), has in a number of cases led to unfulfilled expectations and the arrival on the labour market of large numbers of unqualified youth that the market simply cannot absorb. Here there is a very deep-seated problem of values. As democratization has progressed so have opportunities, but the values placed on the various opportunities have not changed: more value is placed on the 'thinkers' than on the 'doers'. There is thus an enormous problem in changing the value system. It is a problem of communications or even public relations and performance. The general public has to be made aware of the value of the 'doers', and technical and vocational education has to turn in a performance that backs up this message—that is, its products must be sought after. This is often not the case.

A second group of problems revolves around the question of allocation of resources to technical and vocational education and their optimization. In fact the problem has two facets. On the one hand, resources allocated often have no common measure with the objectives of plans at national level, and the technical and vocational education manager at whatever level simply does not have the resources he needs to meet the objectives set. On the other hand, the people in charge of implementing programmes are called upon to make the most rational and optimal use of resources available. On the macrolevel those responsible for technical and vocational education planning must take a hard look at the resources that will be available to them and indeed try to convince those in charge of overall planning that objectives cannot be met unless there is adequate provision for their financing. The question of allocation of resources is crucial. A review of the country reports shows that in many countries, for a number of reasons, foremost among which are the general economic situation and attention to priorities other than education, the proportion of the national budget devoted to education declined in the late 1970s and even more so that devoted to technical and vocational education. This is of course completely out of line with stated objectives. If cutbacks on spending have to be made because of hard times, these cutbacks should be made in relation to the objectives set. This is a question of decision-making, of a hard choice among several alternatives.

In terms of rationalization, those responsible for technical and

vocational education management must make do with what is available to them. Here again much progress remains to be made. The internal efficiency of technical and vocational education can be improved. School facilities can be used for out-of-school programmes, whether for training or for non-formal education programmes administered by the education authorities, or conversely facilities administered by agencies other than the education authorities could be used for training purposes. The question of rationalizing the use of installations has in fact commanded a great deal of attention and is a field where much is being done. The problem of internal efficiency is another matter and a very complex one indeed. The reports from the Latin American countries indicate that a great deal of research is being carried out on the costs that wastages in the technical and vocational education systems entail. The question is how to prevent this wastage, whether in terms of repeaters, drop-outs or graduates who do not find employment in the field for which they prepared.

This leads to the third group of problems, involving the relevancy of technical and vocational education to development or manpower needs. In a great number of cases, the technical and vocational education system is simply not meeting these needs. This, too, is a recurring theme in the reports from a number of countries. To cite one example, it is estimated in Turkey that 30 to 40 per cent of vocational education graduates do not find employment in the fields for which they trained. This fact, repeated in various forms, indicates the problems of co-ordination between technical and vocational education and precise manpower needs. The systems seem to be out of focus. This larger problem has two aspects, one qualitative or even philosophical, and one pragmatic or quantitative. On the qualitative or philosophic level, is it the role of education to be concerned only with quantitative needs? Most educationists would answer in the negative, but would none the less admit that their job as technical and vocational teachers and administrators is to give the student the training necessary for initial employment and ideally the wherewithal to progress in his career with further education and training. Idealism notwithstanding, the major objective of technical and vocational education is to prepare young people for entry-level jobs. This can only be done if there is real co-ordination with the labour market and its projected demand and awareness of the likely trends of change. Close relations are needed with those responsible for planning economic development as well as with the enterprises that will hire the graduates of technical and vocational education programmes. And for a number of countries it is also the responsibility of technical and vocational education to prepare people for job creation, that is, to prepare independent entrepreneurs who will contribute to economic expansion.

If then technical and vocational education is to be relevant to real

economic and manpower needs, instruments have to be created to co-ordinate the effort at all levels, whether in terms of national planning, of co-ordinating education and training efforts, or of co-ordinating co-operation with enterprises. The problem of co-ordination, with all that it implies in regard to the number of agencies involved in most countries, in regard to resource allocation, and in regard to employment and labour-market trends is one that most countries are very well aware of.

The co-ordination issue leads to another that was raised again and again in the country reports and turned out to be one of the major themes of the Experts Meeting: the problem of the mechanics of management. To co-ordinate technical and vocational education with manpower needs, both short- and long-term, and with the training programmes offered outside the education system, requires an information base. This is most often lacking, and even when some relevant information is available, the techniques for analysing it for input into the system are lacking. The information is needed in order to set objectives and then to analyse the extent to which they were met and the progress made. It is a matter of feedback into the system. Here, however, another problem arises, one which concerns not only management but organization as a whole. There must be flexibility of response to new information, and this flexibility is often not built into the administrative structures of technical and vocational education.

Finally, there is the problem of who is going to do all this, of the people involved in planning and managing technical and vocational education. In most countries this corps has been drawn from the ranks of teachers, in many cases teachers whose initial field had little to do with technical and vocational education. Even with the best will in the world and armed with a number of administrative skills, these people may not be equipped to deal with the problems posed by technical and vocational education in the world today. Furthermore, very little provision seems to have been made for training them as technical and vocational education administrators and financial managers. Indeed, the reports are eloquent in their silence on this score. Managers and administrators have to be equipped with the means for dealing with the problems facing them, since it is they who will make the difference between true implementation of objectives and an exercise in pure theory.

Such are the major problems which can be identified from the experience of the sixteen countries concerned in this study. Great efforts are being made to overcome them. These efforts include a number of innovative approaches within the framework of the particular conditions prevailing in an individual country. On the other hand, some general trends may be discerned in approaches to development problems. The major efforts are being made in two areas: better

co-ordination between education and industry and rationalization of available resources.

With regard to better co-ordination with the labour market and development needs in terms of manpower, there is a major trend towards establishing a central agency responsible for both technical and vocational education and training outside the purview of the education system. In some countries such a body is already in place; in others it is projected as a result of studies of the problem. In Argentina such a body has existed for a number of years: CONET, or the National Council for Technical Education, which has an autonomous budget and is responsible for all education and training activities linked to technical and vocational education and training. In Gambia, a National Vocational Training Board was established in 1979 with responsibility for all education and training directed to employment, whether in rural or urban areas. In India, as previously noted, there are a number of bodies at national level responsible for various aspects of co-ordination within the system, but efforts overlap and various commissions are now proposing a National Council for Vocational Education that would be responsible for co-ordinating the efforts made within the education system and outside it to educate and train people for employment. In Ecuador a similar council is proposed—a National Council for Technical Education, with an autonomous budget. The same is the case in Ghana, where, as has been pointed out, the work done under the aegis of the Ghana Education Service and that of the National Vocational Training Board often overlap. A similar proposal has been made in Sri Lanka for the constitution of a Vocational and Technical Training Co-ordinating Body, a proposal coming from two separate research projects, one under the Ministry of Education the other under the Ministry of Labour. The need is recognized, but there is some debate as to where such a body might best be situated.

Alongside this trend there is another designed to link technical and vocational education and the labour market more closely. It should be noted that the two trends are not necessarily incompatible. It is a question of decentralization so as (a) to involve industry in education in terms of policy-making, actual implementation of programmes and so financing, and (b) to make technical and vocational education more responsive to labour-market demand and therefore more flexible. Thus Chile has engaged in a conscious policy of turning over responsibility for technical and vocational education to private enterprises through the intermediary of non-profit corporations, while retaining a function of supervision and accreditation within the Ministry of Education. The rationale for this policy is twofold: on the one hand technical and vocational education will be more closely linked to trends in the labour market and, on the other, the 'users' of the educational 'products' will

be involved in their financing, and so reduce costs to the government and therefore the general public. In 1978 Turkey undertook the OSANOR project, developed by the Centre for Education Research at the University of Ankara. The project, now implemented in four vocational schools, is designed to involve local industry more closely with the educational process by exchange of personnel between education and industry, involvement of industry in certain educational decisions as well as in the process itself, and financial participation of local industry. The advantages of this approach are, of course, flexibility of response and spread of responsibility throughout the community, and therefore broader participation in a common enterprise. The other side of the coin is how to keep the general interest in mind. Here arrangements for accreditation by the public authorities can play a major balancing role.

In line with the task of relating technical and vocational education at local level to community development and manpower needs, programmes in Gambia and India may be cited in the context of rural development. In Gambia the thrust of technical and vocational education is to rural development, since 90 per cent of the population is engaged in agriculture or agriculture-related industries. Rural vocational training is therefore being given priority. Enrolment in secondary education is being discouraged, and primary education is being geared towards practical skills directed to agricultural and rural development, with particular emphasis being given to training for entrepreneurship within a rural environment. Thus school and training facilities are being mobilized to reach out to the villages, where the vast majority of the population is to be found. Here vocational education and training are being directed to grass-roots needs and may well prove all the stronger for this emphasis. In this context it should be noted that in India an effort is being made to develop community polytechnics, that is, to direct the technical and vocational education schools serving rural areas towards meeting some of the real education and training needs of these areas.

With regard to the steps being taken to rationalize the use of facilities and therefore optimize available resources, several countries reported that programmes were being developed to use school facilities for community and non-formal education purposes. Another approach taken to optimize resources, and this within the formal system, may be found in Indonesia. That country's policy is to embark upon manageable projects. Thus for the last decade a major project has been under way, as mentioned in the preceding chapter, to construct and equip technical training centres that serve a number of surrounding schools and other programmes. Such approaches are certainly worth studying, since they represent a very straightforward method of optimizing resources for technical and vocational education and training.

From the data available for this study, these are the major trends of innovation in the planning and management of technical and vocational education. The measures taken in this sample—and the study is by its very nature a sample—do not address all of the problems that arise, whether explicitly or implicitly stated. The tools for planning and management of technical and vocational education still have to be forged, tools that must have a different form for each country. The structures exist for the most part. The machine is ready, though in many cases its design could be improved upon. The problem is getting it in working order. International co-operation can play a large role in forging these tools and in servicing the machine so that in the largest possible sense it meets the 'production' requirements for which it was designed.

# 7 International co-operation

International co-operation is a major channel through which planning and management of technical and vocational education can be improved. It should prove to be particularly effective in this field, given the importance of learning and applying new methodologies of planning and management. To do this requires exchange of experience and information as well as organization of training for planners and administrators, to all of which international co-operation is admirably suited.

All of the countries dealt with in this study are engaged in international co-operation in the field of technical and vocational education either as suppliers of training and technical assistance, or as recipients, or as participants in meetings and seminars sponsored by international organizations.

As noted in the chapter on the financing of technical and vocational education, a number of developing countries call upon international financial institutions for the funding of development projects—the World Bank, the Asian Development Bank, the Inter-American Development Bank, UNDP, the African Development Bank and the Islamic Bank. Ecuador has embarked on a large-scale project for improving and expanding technical and vocational education with aid from the Inter-American Development Bank and has undertaken other projects with assistance from Unesco, ILO and UNDP in conjunction with bilateral aid. The Indonesian project, which has lasted over a decade, to build and equip technical training centres serving a cluster of schools has been funded with aid from the World Bank. Turkey has also called upon international organizations for help in capital financing and technical assistance. There is an ongoing technical education financing project in co-operation with the World Bank for building and equipping technical education facilities. Turkey has also closely co-operated with Unesco, OECD, ILO and the Council of Europe. India's major international partners in developing technical and vocational education are Unesco, UNDP, ILO and the World Bank. This co-operation and that with various national and

regional financing and aid organizations have been particularly close in four areas: technical and vocational teacher-training abroad, secondment of international experts to projects at home, provision of equipment, which, according to the authors of the Indian report, has perhaps had the greatest impact, and finally activities of follow-up and exchange of information. Another example of what may be done through international co-operation for concrete projects is furnished by Chile, which undertook a far-reaching study of its education and training system for the Inter-American Development Bank.

The four industrialized countries involved in this study are of course engaged in international co-operation through their membership in various international and regional organizations. They have also received students from abroad in their educational institutions and have sent their experts abroad through international or bilateral assistance arrangements.

There is little to report of what has been specifically done to improve planning and management in technical and vocational education through international co-operation. The meeting sponsored by the Unesco Regional Office for Latin America in Montevideo in 1982 has already been mentioned; and there was of course the International Experts Meeting at Unesco, which is the basis of the present study. The comparative silence in the reports on training of planners and administrators for technical and vocational education itself indicates the directions to be taken.

These directions were fully stated in the recommendations made by the experts meeting which are presented below in some detail.

The meeting, endorsing the validity of the Revised Recommendation on Technical and Vocational Education, expressed concern that it was not well enough known in Member States and recommended that greater efforts be made to publicize this instrument. One of the activities recommended to this end was the organization by Unesco of a World Conference on Technical and Vocational Education to deal with such topics as raising the status of technical and vocational education in Member States, professional staff development, development of management systems, linking of education to the world of work, integration of theory and practice, promotion of lifelong learning, exchange of research and information and the relation between school and out-of-school education.

Indeed, the gathering and exchange of information on technical and vocational education were among the major concerns of the meeting and, as emphasized here, sound planning and management can only be based on sound information. Systematic exchange of information, ideas and experiences in the field of technical and vocational education should therefore be further expanded. The meeting proposed that an effective infrastructure in the form of

international networks be developed to improve such exchanges. To this end, it recommended that technical assistance and training be provided for under Unesco's future programme to make available pertinent information at national, local and institutional levels and that the exchange of information between institutions be improved.

The meeting made a number of recommendations for international co-operation with specific regard to the management and administration of technical and vocational education. In the first place, it recommended that a new area of activity be added to the present Unesco programme which would deal with the improvement of management and administration of technical and vocational education with particular consideration to the needs of developing countries. Specific recommendations were made for work to be done under this heading.

One of the trends in developing countries, as already observed, is to set up national councils or agencies for co-ordinating technical and vocational education and training internally and externally with regard to the various employment sectors. The meeting recommended that the role and functions of such bodies be studied and the research results made widely available. This exercise would be especially timely, since in a number of countries the creation of such agencies is still either a policy consideration or in the very early planning stages. Studies of this kind might prove especially useful in helping countries design such bodies and delegate functions so as to avoid one of the major pitfalls: further isolation of technical and vocational education from the educational mainstream.

One of the key problems facing countries in the development of their systems of technical and vocational education and training is lack of adjustment between what the education system is producing in terms of trained manpower and real manpower needs. Here again international co-operation could usefully enter in. The meeting recommended that research be undertaken and guidelines developed for more effective use of manpower forecasts, including application of simulation models in the educational planning process and development of effective evaluation and monitoring systems. Such international activities would also be designed to include a training component.

Perhaps the greatest difficulty facing technical and vocational education planners and administrators is that of allocating limited resources to the best advantage and maximizing their use. Adaptation and application of the techniques of economic analysis to educational management problems hold a great deal of promise for improving technical and vocational education efficiency and performance by helping managers to choose the most effective alternatives. The meeting thus recommended that a further set of guidelines be de-

veloped to aid Member States in making cost-effectiveness analyses of programmes and systems of technical and vocational education. In this connection the experts also recommended that an exchange and training programme for planning personnel be foreseen in Unesco activities. The Organization could also sponsor the development of a set of training models and regional training courses, along with study tours for management and administrative personnel.

Such studies have of course to be founded on a solid information base. As observed in the chapter on financing, it is very difficult indeed to compare costs of technical and vocational education in the various countries because the figures given are not derived from the same bases. In order to heighten the exchange of information as well as to develop this sound base, the experts suggested that a study be undertaken on unit costing in various educational and training programmes and that uniform criteria for such costing be developed.

The priority areas for international co-operation may then be summed up as follows:

Promotion of the gathering, analysis and distribution of information.

Creation of the conditions in which information is more readily available and easily exchanged, either through publications made available through information networks or by bringing concerned people together to exchange information and experience.

Promotion of research on two levels: (a) on how to bring about a better adjustment between education and employment through better co-ordination and through a closer relationship between manpower needs and educational programmes; and (b) on the application of management techniques, including economic analysis, in order to design, implement, monitor and evaluate technical and vocational education with the objective of better and more efficient performance so as to contribute to the achievement of the employment and career goals of individuals and to those of society.

Planning and management training for technical and vocational education planners and administrators.

The Expert Meeting also noted that a management-studies and training component could be very usefully included in operations projects financed from extra-budgetary sources.

The meeting was itself an excellent example of what may be done through international co-operation. It brought together technical and vocational education planners and administrators from countries in all parts of the globe and at all levels of development to exchange information on an aspect of technical and vocational education that until recently has been relatively neglected. The meeting also occasioned new research in terms of the country reports. The authors of the Sri Lanka report stated that it was one of the most comprehensive to date on technical and vocational education in that country.

In any discussion of international co-operation it should not be forgotten that the establishment of a new economic order is one of the major priorities of the international community. This reminder is all the more pertinent in any discussion of technical and vocational education. Economic change requires trained and competent men and women. Much has undoubtedly been accomplished through international co-operation in training leaders in this field but much still remains to be done. Thanks to the efforts in the last decade and more, there has been a great deal of progress making it possible to pinpoint some of the major weaknesses. If these were to be analysed and successfully overcome, there could well be what it known as a 'snowball effect'. From the evidence in this study there are two weaknesses in terms of policy formulation, planning and administration of technical and vocational education: maladjustment between stated priorities and actual resources available and allocated and, secondly, a shortfall in the technical resources or methodologies applied to co-ordination of technical and vocational education and training and its further co-ordination with manpower and development needs, to evaluation of programmes and performance and to feedback into policy-making. Such techniques, whether in regard to research or analysis, are neutral. The questions they are called upon to answer are not. They rise out of cultural, social, historical, political, ideological and economic circumstances. Grasping these techniques is a matter of honing a universal tool. International co-operation can play a determining role and can in fact aid in determining the questions to be asked. Although each country will find answers according to its living experience, the fact that common questions are asked and common tools applied will have arisen out of co-operation, which in turn will beget increased mutual understanding. International co-operation can continue to be a major vehicle for change. If organized so as to promote exchange of the techniques required for improving technical and vocational education from the point of view of better planning and management and therefore to have the desired snowball effect, international co-operation in the field of technical and vocational education will make a further contribution to the establishment of the new economic order.

# 8 In conclusion: looking back and looking ahead

Well-organized and efficiently functioning technical and vocational education and training are undoubtedly one of the keys to economic development and hence to new economic relations among nations, that is, the New International Economic Order. As stated at the beginning of this study, the problem is one of mechanics. Overall agreement on policy objectives is there, the issue is how to implement those objectives, how to make the reality correspond with the ideal. On the basis of the reports, of the research done, of the conclusions drawn by the countries themselves, the valid approaches and perhaps even some of the answers seem perceptible.

The apparatus is in place in the majority of countries for the planning of economic development. There is often consultation between the planning authorities and those responsible for programming technical and vocational education and training. But achievements or performance do not always correspond to plans; there are few channels for evaluation and feedback; and resources for technical and vocational education are often not clearly defined. Above all, and this is the major problem according to the majority of the reports, there is little co-ordination between the education system and the world of work.

Efforts have been and are being made. There is a trend towards establishing central bodies for overall co-ordination of technical and vocational education in the traditional school system with training outside the school. This is already an enormous task, given the number of agencies involved in the field—for what are usually historical reasons. The problem remains to co-ordinate the whole with what economic development requires, with what the labour market demands.

One approach already observed is towards decentralization or at least a shift of responsibility downward, with programmes for local industry and local institutions to work together in programme design, in providing facilities and teaching and training staff, in placing graduates and in follow-up. Such approaches, however, must be taken

with due regard to the interests of overall national development and mechanisms built in to allow good results to have an impact vertically and horizontially since otherwise there may be a tendency towards parochialism.

Generally speaking, the problem of co-ordination between education and employment arises at two levels: the research level and the level of ongoing implementation, that is the administrative and management level. As far as research is concerned, the right questions must be asked and research must be organized so that the results have an impact. Only rarely have studies been done on what happens to people once they graduate from a technical and vocational education programme. Answers to this question would prove invaluable in identifying what could be done to bring about better adjustments between education and training and the world of work. With respect to the impact of research, the results have in the first place to be made known to the people concerned before decisions can be taken. It would seem that an injection of new techniques might prove very useful just as it would prove useful in all aspects of technical and vocational education planning, management and administration so that better and more rational initial decisions can be made, achievements and problems identified, evaluation carried out, and the results fed back into the system. Nor should it be forgotten that such management techniques are just as applicable on a macro level as on a micro level. Each may be equally well applied to overall planning and decision-making on a national scale and to operations at institutional level.

This poses the question of further developing and applying these techniques in the varied environments of the international community. It is basically a matter of informing and offering training to managers and administrators already taking responsibility, as well as of training those of the future, that is, practising and trainee technical and vocational teachers. In this task of promoting research and exchange of information on these techniques and their applications as well as in the matter of training, international co-operation can and should play a major role.

In this brief summary the question of finance has so far been left aside. The evidence indicates that technical and vocational education costs a great deal, relatively speaking, that is, per person graduated; at the same time, expenditure is neither commensurate with costs nor with stated priorities. Obviously, no magic trick can change this situation overnight. The only possible approach is a hard analysis of the funds that can be reasonably allocated to technical and vocational education and training, and a clear determination of this allocation so that it does not become confounded in a general education budget. Only with such an approach can the parameters be established that allow technical and vocational education planners and administrators

to maximize their efforts and national planners to establish goals that can be realistically achieved.

The present study has intentionally been limited in its focus so as to highlight one aspect of the technical and vocational education process and the problems involved, especially for developing countries. In this respect it should be observed that the country reports are much richer in content than might be thought from this study, for having been researched and written according to the guidelines to be found in Appendix III, they mostly covered all aspects of technical and vocational education and training in their different countries. But the sharper focus on technical and vocational education policy formulation, planning, management and administration seems justified. The extent to which these are soundly based and effectively implemented will determine the extent to which technical and vocational education meets the objectives set for it. In other words, the sound design and smooth running of the 'machine' will then do what all good machines are intended to do: serve man and improve the material quality of human life.

# Appendices

# I. Revised Recommendation concerning Technical and Vocational Education

*In order to promote more widespread knowledge of this Recommendation, the full text is reproduced below. The exercise is particularly timely in view of the fact that Unesco is considering the possibility of drafting a text for a possible convention on technical and vocational education to be submitted for approval to Member States.*

The General Conference of the United Nations Educational, Scientific and Cultural Organization, meeting in Paris, at its eighteenth session, held from 17 October to 23 November 1974,

*Recalling* the constitutional responsibilities of the Organization for the promotion of education,

*Recognizing* that technical and vocational education have to contribute to the maintenance of peace and friendly understanding between the various nations,

*Considering* that education must now be seen as a lifelong process,

*Recognizing* that technical and vocational education is a prerequisite for sustaining the complex structure of modern civilization and economic and social development,

*Recalling* the principles set forth in Articles 23 and 26 of the Universal Declaration of Human Rights guaranteeing all the right to work and to education,

*Considering* therefore that all have a right to an education enabling full participation in contemporary society,

*Taking* into account the diversity of education systems throughout the world, as well as the particular and urgent needs of developing countries,

*Considering* that in spite of this diversity similar goals are pursued and similar questions and problems arise in all countries concerning technical and vocational education and that therefore common standards and measures are called for,

*Having* adopted for this purpose at its twelfth session the Recommendation concerning Technical and Vocational Education,

*Recognizing*, however, that the rapid technological and educational changes of the last decade require new, creative and efficient efforts in technical and vocational education to improve education as a whole for social, economic and cultural development,

*Having* decided at its seventeenth session that in view of these changes this Recommendation should be revised in order better to serve Member States,

*Noting* that the International Labour Conference has adopted, over the years, a number of instruments dealing with various aspects of vocational guidance and vocational training and, in particular, the Vocational Guidance Recommendation, 1949, the Vocational Training (Agriculture) Recommendation, 1956, and the Vocational Training Recommendation, 1962, and that the Conference, at its fifty-ninth session, had adopted substantive conclusions with a view to adoption, in 1975, of a new instrument or instruments on vocational guidance and vocational training,

*Noting* further the close collaboration between Unesco and the International Labour Organisation (ILO) in drawing up their respective instruments so that they pursue harmonious objectives, avoiding duplication and conflict, and with a view to continued collaboration for effective implementation of the two instruments,

*Adopts* this Recommendation this nineteenth day of November 1974,

*The General Conference* recommends that when developing and improving technical and vocational education, Member States should apply the following provisions by taking whatever legislative or other steps may be required to give effect, within their respective territories, to the principles set forth in this Recommendation,

*The General Conference* recommends that Member States should bring this Recommendation to the knowledge of the authorities and bodies concerned with technical and vocational education,

*The General Conference* recommends that Member States should report to it, at such times and in such manner as shall be determined by it, on the action they have taken to give effect to the Recommendation.

## I. Scope

1. This Recommendation applies to all forms and aspects of education which are technical and vocational in nature provided either in educational institutions or under their authority, directly by public authorities, or through other forms of organized education, public or private.
2. For the purposes of this Recommendation: 'technical and vocational education' is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. Technical and vocational education is further understood to be:
   (a) an integral part of general education;
   (b) a means of preparing for an occupational field;
   (c) an aspect of continuing education.
3. Technical and vocational education, being part of the total educational process, is included in the term 'education' as defined in the Convention and Recommendation against Discrimination in Education adopted by

the General Conference of the United Nations Educational, Scientific and Cultural Organization at its eleventh session and the provisions of that Convention and Recommendation are therefore applicable to it.

4. This Recommendation should be understood as setting forth general principles, goals and guidelines to be applied by each individual country according to needs and resources. The application of the provisions in their particulars and the timing of the implementation will therefore depend upon the conditions existing in a given country.

## II. Technical and vocational education in relation to the educational process: objectives

5. Given immense scientific and technological development, either in progress or envisaged, which characterizes the present era, technical and vocational education should be a vital aspect of the educational process and in particular should:
   (a) contribute to the achievement of society's goals of greater democratization and social, cultural and economic development, while at the same time developing the potential of individuals for active participation in the establishment and implementation of these goals;
   (b) lead to an understanding of the scientific and technological aspects of contemporary civilization in such a way that men comprehend their environment and are capable of acting upon it while taking a critical view of the social, political and environmental implications of scientific and technological change.
6. Given the necessity for new relationships between education, working life, and the community as a whole, technical and vocational education should exist as part of a system of lifelong education adapted to the needs of each particular country. This system should be directed to:
   (a) abolishing barriers between levels and areas of education, between education and employment, and between school and society through: (i) the integration of technical and vocational and general education in all educational streams above primary level; (ii) the creation of open and flexible educational structures; (iii) the taking into account of individuals' educational needs and of the evolution of occupations and jobs;
   (b) improving the quality of life by permitting the individual to expand his intellectual horizons and to acquire and constantly to improve professional skills and knowledge while allowing society to utilize the fruits of economic and technological change for the general welfare.
7. Technical and vocational education should begin with a broad basic vocational education, thus facilitating horizontal and vertical articulation within the education system and between school and employment thus contributing to the elimination of all forms of discrimination and should be designed so that it:
   (a) is an integral part of everyone's basic general education in the form of initiation to technology and to the world of work;

(b) may be freely and positively chosen as the means by which one develops talents, interests and skills leading to an occupation in the sectors listed in paragraph 2 or to further education;
(c) allows access to other aspects and areas of education at all levels by being grounded on a solid general education and, as a result of the integration mentioned in paragraph 6(a), containing a general education component through all stages of specialization;
(d) allows transfers from one field to another within technical and vocational education;
(e) is readily available to all and for all appropriate types of specialization, within and outside formal education systems, and in conjunction or in parallel with training in order to permit educational, career and job mobility at a minimum age at which the general basic education is considered to have been acquired, according to the education system in force in each country;
(f) is available on the above terms and on a basis of equality to women as well as men;
(g) is available to disadvantaged and handicapped persons in special forms adapted to their needs in order to integrate them more easily into society.

8. In terms of the needs and aspirations of individuals, technical and vocational education should:
(a) permit the harmonious development of personality and character and foster the spiritual and human values, the capacity for understanding, judgement, critical thinking and self-expression;
(b) prepare the individual to learn continuously by developing the necessary mental tools, practical skills and attitudes;
(c) develop capacities for decision-making and the qualities necessary for active and intelligent participation, teamwork and leadership at work and in the community as a whole.

**III. Policy, planning and administration**

9. Policy should be formulated and technical and vocational education administered in support of the general objectives adopted for the educational process as well as for national and, if possible, regional social and economic requirements, and an appropriate legislative and financial framework adopted. Policy should be directed to both the structural and the qualitative improvement of technical and vocational education.
10. Particular attention should be given to planning the development and expansion of technical and vocational education:
(a) high priority should be placed on technical and vocational education in national development plans as well as in plans for educational reform;
(b) planning should be based upon a thorough evaluation of both short-term and long-term needs taking into consideration any variation in needs which may exist within a country;
(c) adequate provision for proper current and future allocation of financial resources should be a major element of planning;

(d) planning should be done by a responsible body or bodies having authority on the national level. This body should have available to it data which have been collated, analysed, synthesized and interpreted by qualified staff provided with adequate research facilities.

11. Planning should be responsible to national and, if possible, regional economic and social trends, to projected changes in demand for different classes by goods and services, and for different types of skills and knowledge in such a way that technical and vocational education may easily adapt to the evolving situation be it rural or urban. This planning should also be co-ordinated with current and projected training action and the evolution of employment.

12. While the education authorities should have primary responsibility, the following groups and authorities should be actively associated in policy formulation, and in the planning process. Structures, on both national and local levels, taking the form of public agencies or consultative or advisory bodies, should be created to permit this:
    (a) public authorities responsible for planning economic and social policy, labour and employment, and for the various occupational sectors (industry, agriculture, commerce);
    (b) representatives of non-governmental organizations within each occupation sector from among employers and workers;
    (c) any authority or body, such as a training body or extension services, responsible for out-of-school education and training;
    (d) representatives of those responsible—both in public education and in state-recognized private education—for executing educational policy including teachers, examining bodies and administrators;
    (e) parent, former pupil, student and youth organizations;
    (f) representatives from the community at large.

13. Policies for the structural improvement of technical and vocational education should be established within the framework of broad policies designed to implement the principle of lifelong education through the creation of open, flexible and complementary structures for education, training and educational and vocational guidance, regardless of whether these activities take place within the system of formal education or outside it. In this respect consideration should be given to the following:
    (a) multipurpose secondary education offering diversified curricula including work-study programmes;
    (b) open tertiary institutions recruiting from a variety of sources and offering programmes ranging from short specialized ones to longer full-time programmes of integrated studies and professional specialization;
    (c) establishing a system of equivalencies whereby credit is given for completion of any approved programme, and recognition is granted educational and professional qualifications achieved through various means.

14. Policy should be directed to ensuring high quality in such a way as to exclude the possibility of any judgement which discriminates between the different educational streams, whatever their ultimate goal. In this respect special efforts should be made to ensure that technical and

vocational education in rural areas meets the same standards as that offered in urban ones.

15. In order to ensure quality, responsible national authorities should establish certain criteria and standards, subject to periodic review and evaluation, applying in all aspects of technical and vocational education, including to the extent possible non-formal education for:
    (a) all forms of recognition of achievement and consequent qualification;
    (b) staff qualifications;
    (c) ratios of teaching and training staff to learners;
    (d) the quality of curricula and teaching materials;
    (e) safety precautions for all learning environments;
    (f) physical facilities, building, workshop layout, quality and type of equipment.
16. Policies should be established fostering research related to technical and vocational education, with particular emphasis on its potential within lifelong education, and directed to its improvement. This research should be carried out by competent staff on national and institutional levels as well as through individual initiative. To this end:
    (a) special emphasis should be placed on curriculum development, research concerning teaching and learning methods and materials, and where the need exists, on technologies and techniques applied to development problems;
    (b) financial resources and physical facilities should be made available through institutions of higher education, specialized research institutions and professional organizations for applying the results of this research on an experimental basis in representatively selected institutions for technical and vocational education;
    (c) channels should be created for the widespread dissemination and rapid application of the positive results of research and experimentation;
    (d) the effectiveness of technical and vocational education should be evaluated using, among other data, relevant statistics including those concerning part-time enrolments and drop-out rates which are in some cases neglected;
    (e) particular attention should be given to all research efforts to humanize working conditions.
17. Provision should be made within administrative structures for evaluation, supervisory and accreditation services, staffed by technical and vocational education specialists, to ensure the rapid application of new research findings and to maintain standards:
    (a) evaluation services as a whole should ensure the quality and smooth operation of technical and vocational education by continuous review and action directed to constant improvement of staff, facilities and programmes;
    (b) supervisory services for the staff should encourage improvement in the quality of teaching by providing guidance and advice and recommending continuing education;
    (c) all programmes of technical and vocational education, in particular

those offered by private bodies, should be subject to approval by the public authorities through some means of accreditation or form of public inspection.

18. Particular attention should be given to the material resources required for technical and vocational education. Priorities should be carefully established with due regard for immediate needs and the probable directions of future expansion and adequate cost controls introduced:
    (a) institutional planning should be directed to ensuring maximum efficiency and flexibility in use;
    (b) the planning, construction and equipping of facilities should be carried out in collaboration with specialist teachers and educational architects and with due regard for their purpose, prevailing local factors and relevant research;
    (c) adequate funds should be allocated for recurrent expenditure for supplies and maintenance and repair of equipment.

**IV. Technical and vocational aspects of general education**

19. An initiation to technology and to the world of work should be an essential component of general education without which this education is incomplete. An understanding of the technological facet of modern culture in both its positive and negative attributes, and an appreciation of work requiring practical skills should thereby be acquired. This initiation should further be a major concern in educational reform and change with a view to greater democratization of education. It should be a required element in the curriculum, beginning in primary education and continuing through the early years of secondary education.
20. Opportunities for general technical and vocational initiation should continue to be available to those who wish to avail themselves of it within the educational system and outside it in places of work or community centres.
21. The technical and vocational initiation in the general education of youth should fulfil the educational requirements of all ranges of interest and ability. It should mainly perform three functions:
    (a) to enlarge educational horizons by serving as an introduction to the world of work and the world of technology and its products through the exploration of materials, tools, techniques and the process of production, distribution and management as a whole, and to broaden the learning process through practical experience;
    (b) to orient those with the interest and ability towards technical and vocational education as preparation for an occupational field or towards training outside the formal education system;
    (c) to promote in those who will leave formal education at whatever level but with no specific occupational aims or skills, attitudes of mind and ways of thought likely to enhance their aptitudes and potential, to facilitate the choice of an occupation and access to a first job, and to permit them to continue their vocational training and personal education.

22. Required general technical and vocational studies in the schools having great importance for the orientation and education of youth programmes, should include a proper balance between theoretical and practical work. A properly structured programme of such studies should be drawn up by the competent authorities in collaboration with the professional community and with those responsible for technical and vocational education. These programmes should:
    (a) be based upon a problem-solving and experimental approach and involve experience in planning methods and decision-making;
    (b) introduce the learner to a broad spectrum of technological fields and at the same time to productive work situations;
    (c) develop a certain command of valuable practical skills such as tool use, repair and maintenance and safety procedures, whether applicable to future education, training and employment or to leisure time, and a respect for their value;
    (d) develop an appreciation of good design and craftsmanship and the ability to select goods on the basis of their quality;
    (e) develop the ability to communicate including the use of graphical means;
    (f) develop the ability to measure and calculate accurately;
    (g) be closely related to the local environment without, however, being limited to it.
23. The technical and vocational initiation in programmes of general educational enrichment for older youth and adults should be directed to enabling those engaged in working life to:
    (a) understand the general implications of technical change, its impact on their professional and private lives, and how man may shape this change;
    (b) to use practical skills for improving the home and community environment and thus the quality of life and, in appropriate conditions, for productive leisure-time activities.

**V. Technical and vocational education as preparation for an occupational field**

24. Given disparities that may exist between formal education, whether secondary or tertiary, and the employment and career opportunities available, the highest priority should be given to technical and vocational education which prepares young people to exercise occupations in the sectors covered by this Recommendation. Consequently the structure and content of traditional education, whether general or technical and vocation, should be adapted accordingly through:
    (a) the diversification of secondary education in the later stages so that it may be pursued in conjunction with employment or training, or may lead to employment or to higher education, thereby offering to all youth educational options corresponding to their needs;
    (b) the introduction of new programmes into tertiary education more relevant to the career needs of young adults;

(c) the development of educational structures and programmes on all levels centred on organized and flexible interchange between educational institutions including training institutions and those responsible for employment in the various occupational sectors.

25. Technical and vocational education as preparation for an occupational field should provide the foundation for productive and satisfying careers and should:
    (a) lead to the acquisition of broad knowledge and basic skills applicable to a number of occupations within a given field so that the individual is not limited by his education in his freedom of occupational choice, and later transfer from one field to another in the course of working life is facilitated;
    (b) at the same time offer a thorough and specialized preparation for initial employment and effective training within employment;
    (c) provide the background in terms of skills, knowledge and attitudes, for continuing education at any point in the individual's working life.
26. Premature and narrow specialization should be avoided:
    (a) in principle 15 should be considered the lower age limit for beginning specialization;
    (b) a period of common studies concerning basic knowledge and skills should be required for each broad occupational sector before a special branch is chosen.
27. Because it is desirable that women seek wider participation in all kinds of occupations outside family and domestic activities, they should have the same educational opportunities available to them as men in order to prepare for an occupation and should be encouraged to take advantage of these through appropriate legislative measures and widespread distribution of information concerning these opportunities.
28. Special provision should be made for out-of-school and unemployed youth and children of migrant workers with the minimum or less of primary education, as well as for those not entering education or training programmes after completion of compulsory schooling, in order that they may acquire employable skills.
29. Given the necessity of integrating the physically and mentally disadvantaged into society and its occupations, the same educational opportunities should available to them as to the non-handicapped in order that they may achieve qualification for an occupation; special measures or special institutions may be required.

*Organization*

30. Technical and vocational education as preparation for an occupational field should be organized on a national or, if possible, regional basis, so as to respond positively to overall social, economic and educational requirements and to the needs of different groups of the population without discrimination.
31. Several organizational patterns of technical and vocational education, including both full-time and part-time options should exist within each

country. The following patterns of organization for example should be considered:

(a) full-time including practical training as well as general education, provided in an educational establishment, either comprehensive or specialized;

(b) part-time programmes such as the following in which general education and theoretical and broad practical aspects of the occupational field are given in an educational establishment while specialized practical training is acquired during work in the chosen occupation: (i) the day-release system providing for young workers and apprentices to attend an educational establishment at least one day a week and preferably two; (ii) the sandwich system under which periods in an educational institution alternate with training periods in a factory, farm, business establishment or other undertaking; (iii) the block-release system whereby young workers are released to attend courses for one or two short periods of at least ten to fifteen weeks in total length per year which may be especially adapted to conditions in areas of low population density by provision of boarding facilities.

32. The responsible authorities should encourage part-time education, therefore:

(a) these programmes should be available directly after completion of minimum compulsory or required schooling, and should continue to be available to the highest level of formal education;

(b) the educational qualifications acquired by this means should be equivalent to those acquired by full-time education;

(c) where employers are responsible for the practical training aspect for part-time students, this training should be as broad as possible serving the educational and training needs of the individual, and should meet national standards.

33. In view of the increasing requirement for highly qualified middle-level manpower in all fields, and the increasing numbers completing secondary education or its equivalent, the development of programmes of technical and vocational education corresponding to further qualifying tertiary education should be given high priority. The following patterns of organization should be considered:

(a) a period .of from one to two years of guided work experience followed by a part-time or briefer full-time programmes of specialization;

(b) part-time programmes;

(c) full-time programmes as an extension of programmes given in specialized secondary institutions or given in tertiary institutions.

34. The high cost of equipment for the practical component of technical and vocational education requires that this be organized so that benefits received are in proportion to the cost. Consideration should be given to the following as a means of achieving this:

(a) centralized workshops, or mobile units, could be used to serve several educational institutions;

(b) workshops attached to educational institutions could be designed so

that they are suitable for use by the community at large particularly for continuing education programmes;

(c) although workshops and laboratories in advanced secondary or tertiary institutions should be designed primarily for pedagogical purposes, they might also be equipped and staffed so that equipment for use in technical and vocational studies in general education may be produced.

35. Enterprises should be closely associated in the practical training of those preparing for occupations in their particular sector, and should be encouraged to take responsibility, in co-operation with educational institutions, for the organization of this training.

*Programme content*

36. All programmes of technical and vocational education as preparation for an occupational field should:

(a) aim at providing scientific knowledge, technical versatility and the broad skills and knowledge required for rapid adaptation to new ideas and procedures and for steady career development;

(b) be based on an analysis of broad occupational requirements worked out for the long term between education authorities including organizations representing educational research and administration and employment authorities and occupational organizations concerned;

(c) include a proper balance between general subjects, science and technology, and studies of both the theoretical and practical aspects of the occupational field, with the practical component in all cases related to the theoretical one;

(d) stress developing a sense of professional values and responsibilities from the standpoint of human needs.

37. In particular programmes should:

(a) whenever possible be interdisciplinary in character as many occupations now require knowledge and training in two or more traditional areas of study;

(b) be based on curricula designed around core knowledge and skills;

(c) include studies of the social and economic aspects of the occupational field as a whole;

(d) include the study of at least one foreign language of international use which, while conducive to a higher cultural level, will give special emphasis to the requirements of communication and the acquisition of a scientific and technical vocabulary;

(e) include an introduction to organizational and planning skills;

(f) emphasize instruction in safety procedures relative to the materials and equipment used in a given occupational field and the importance of safe working conditions and the health aspects relative to the occupation as a whole.

38. While based on the above general principles and components, and thus pursuing in all cases broader educational aims, programmes in their practical aspect should be designed taking into account special occup-

ational requirements with regard to the particular executive, organization, analytical and practical skills required.

39. Technical and vocational education programmes leading to university qualification, while encouraging research and offering high-level specialization, should be developed with particular attention to:
    (a) the inclusion of components directed to developing attitudes whereby those with broad responsibilities in technological fields constantly relate their professional tasks to larger human goals;
    (b) relating more closely higher technical and vocational education for the industrial and agricultural sectors to the requirements of these sectors. In this regard consideration should be given to creating within tertiary institutions, centres for the testing and certification of industrial and agricultural products, supervised by the public authorities and serving both educational and research purposes.
40. Programmes of technical and vocational education as preparation for occupations within the agricultural sector should be designed in accordance with the overall social and economic requirements of rural development. Therefore:
    (a) both general aspects and the technical and vocational aspects, while adapted in terms of both organization and content to the special requirements of agricultural occupations, should be of the same quality as those for other occupational areas;
    (b) programmes should be directed to the development and application of technologies especially suited to rural development through close co-ordination between education and extension services and between these and research services and institutions;
    (c) programmes should be directed to preparing qualified people for all types of occupations and ranges of technical competence necessary for rural development;
    (d) programmes should be broadly conceived, including in addition to the special occupational area, an introduction to the commercial aspects of agriculture and the functioning of rural economic institutions.
41. Where lack of resources limits the expansion of technical and vocational education, emphasis in the initial stages should be placed on developing programmes for occupations in areas of critical manpower shortage, and in areas of immediate development potential.
42. Programmes preparing for occupations in small industry, individual farming or the artisan trades, whether urban or rural, and particularly for self-employment, should include commercial studies enabling those engaged in such occupations to take responsibility not only for production, but also for marketing, competent management and the rational organization of the whole enterprise.
43. Programmes leading to occupations in the business and commercial sector should include:
    (a) a thorough grounding in the methods and skills developed as a result of the application of technology to business and office management and particularly to the acquisition and processing of information;

(b) training in the organizational and management skills required for the smooth operation of enterprises in all economic sectors;
(c) an introduction to marketing and distribution procedures.

44. Special attention should be given to developing programmes for preparing personnel at all levels for the social services sector (e.g. community and family work, nursing and paramedical occupations, nutrition and food technology, home economics and environmental improvement). Those programmes should:
(a) emphasize the relation of the special occupational field to raising standards of living in terms of food, clothing, housing, medical services, the quality of family life or that of the environment as the case may be;
(b) be well adapted to the special requirements of local conditions in particular those of climate and geography, materials available and community organization and social patterns.

## VI. Technical and vocational education as continuing education

45. The development and expansion of technical and vocational education as continuing education, both within and outside the formal education system, and within the framework of lifelong education, should be a priority objective of all educational strategies and broad provision should be made for allowing everyone, whatever the educational qualifications achieved prior to employment, to continue both their professional and general education.
46. In addition to permitting adults to make up deficiencies in general education or professional qualifications, which has often been the only objective of continuing education, it should now:
(a) offer possibilities of personal development and professional advancement;
(b) permit the updating and refreshing of knowledge and practical abilities and skills in the occupational field;
(c) enable the individual to adapt to technological changes in his occupation or to enter another occupation if these changes render his particular job obsolete;
(d) be available throughout working life without restriction of age, sex, prior education and training or position;
(e) be broad in scope, including general education elements, and not simply specialized training for one particular job.
47. The appropriate authorities should be encouraged to provide the basic conditions for technical and vocational education as continuing education, including consideration of measures providing for paid educational leave or other forms of financial aid.
48. The technical and vocational aspect of continuing education should actively be encouraged through such means as:
(a) widespread dissemination of information concerning the programmes available, and how one may take advantage of existing opportunities, including full use of mass media to this end;

(b) recognition of successful completion of programmes in terms of remuneration and professional advancement.

49. Those responsible for organizing programmes of continuing technical and vocational education recognized by the public authorities should consider the following forms:
    (a) courses given during working hours at the place of work;
    (b) fuller part-time courses especially designed for continuing education given in secondary and tertiary institutions, already staffed and equipped for technical and vocational education;
    (c) evening and week-end courses given in the above types of institutions or in community centres;
    (d) correspondence courses;
    (e) courses given on educational television;
    (f) periodic seminars;
    (g) inter-enterprise programmes;
    (h) informal discussion groups created and organized on the initiative of students.
50. The following forms of organization of leave should be considered:
    (a) day release;
    (b) block release of varying lengths;
    (c) release for one or more hours during the working day.
51. Programmes of technical and vocational education as continuing education should:
    (a) be designed and taught on the basis of the special requirements of adults, and use teaching methods which take into account the expertise which they have already acquired;
    (b) contain a built-in mechanism for rapid adjustment to the needs of particular individuals or groups and to technological change.
52. Special provision should be made for groups with particular requirements:
    (a) in the case of women, because of the necessity of periods of absence from the labour force imposed by maternity and family responsibilities, in order to enable them to update their knowledge and to improve their professional skills for re-entry into employment;
    (b) to enable older workers to adapt to new occupations;
    (c) to provide foreign workers and handicapped workers with specific facilities for pre-training to enable them to adapt to a training programme or to working life;
    (d) the resources of continuing education should be used to offer unskilled and semi-skilled workers the opportunity to improve their qualifications.
53. Particular attention should be paid to the development of continuing education programmes suitable in rural areas in terms of content, physical location and time of year offered.

**VII. Guidance**

54. Guidance should be viewed as a continuous process and a vital element in education, directed to aiding all to make positive educational and

occupational choices. It should ensure that the individual be provided with the necessary prerequisites:

(a) to become aware of his interests and abilities and able to set himself precise objectives;
(b) to pursue a course of education, whether preparatory or continuing, commensurate with these;
(c) to make decisions concerning his occupation, both in the initial and later stages, which lead to a satisfying career;
(d) to facilitate transitions between education and employment at whatever level or stage.

55. Guidance services on the national, local and institutional levels should ensure that the paths are kept open between education and initial training and employment, and employment and continuing education and training through:
    (a) close liaison and co-ordination with training, counselling, employment and placement services;
    (b) ensuring that all necessary information concerning employment and career opportunities is available and actively disseminated;
    (c) ensuring that those in employment have access to information concerning opportunities in continuing education and training.
56. While emphasizing the needs of the individual, guidance for young people should be accompanied by information which gives them a realistic view of the opportunities available in a given occupational cluster, including information regarding probable developments in the market and in employment structures, and what may be expected in terms of remuneration, career advancement and possibilities for occupational change.
57. Particular attention should be given to guidance for girls and women:
    (a) this guidance should cover the same broad range of education, training and employment opportunities as for boys and men;
    (b) it should systematically encourage girls and women to take advantage of the opportunities available to them.
58. Guidance given in the technical and vocational aspects of general education during the observation or orientation cycle of secondary schooling should:
    (a) cover a broad range of occupations with supplementary visits to work places and acquaint the student with the eventual necessity of choosing an occupation and the importance of this choice being as rational as possible;
    (b) aid students in making a positive choice concerning educational streams or options for those wishing to pursue technical and vocational education as preparation for an occupational field or training programmes outside the educational system, and aid those not continuing their formal education or entering training to find employment, while encouraging them to continue their education at a later date.
59. Guidance in technical and vocational education as preparation for an occupational field should:
    (a) inform the student of the various possibilities open in the particular

field of interest, the educational background required and the possibilities for later continuing education available;
(b) encourage the student to choose an educational programme which will limit his later employment options as little as possible;
(c) follow the progress of the student during the educational programmes;
(d) supplement the later stages of the programmes by short periods of work experience and study of real work situations.

60. Guidance in technical and vocational education as continuing education should:
(a) help the employed adult choose the programme of continuing education most suited to his needs;
(b) enable him to place himself in relation to the various levels of study and afford him the means of making effective choices.

61. Guidance should be given on the basis of:
(a) knowledge of the individual which takes account of the social and family factors influencing his attitudes and expectations;
(b) information obtained from objective evaluation of the results of testing including aptitude tests;
(c) knowledge of his educational achievements and/or achievements in employment;
(d) knowledge of employment and career opportunities as well as job satisfaction in the occupational sector in which he is interested or engaged and of demands made;
(e) medical records indicating whether the student is physically able to pursue a given occupation.

62. The effectiveness of guidance services should continually be assessed and statistics kept on both the national and institutional levels through:
(a) the keeping of cumulative records concerning the education of the students as well as follow-up records concerning his employment;
(b) a built-in system of evaluation of both quality of staff performance and the methods used in order to effect change or improvement where needed.

**VIII. The teaching and learning processes: methods and materials**

63. In all aspects of technical and vocational education, the methodology of learning should assume equal importance in the teaching and learning process with the subject-matter itself. All aspects of technical and vocational education should be oriented to the needs of the learner and directed to motivating him, and methods and materials developed accordingly.

64. Theory and practice should form an integrated whole: what is learned in the laboratory, workshop or in enterprises should be directly related to the mathematical and scientific foundations of the particular operation or process, and conversely, technical theory, as well as the mathematics and science sustaining it, should be illustrated through their practical applications.

65. Full use should be made of the resources provided by educational technology, with special emphasis on the methods and materials of self-education, in particular audio-visual aids, including multi-media systems, programmed instruction and the use of mass media.
66. The methods and materials used in technical and vocational education should be carefully adapted to the group to be taught. In this respect:
    (a) where the language of instruction differs from the native language, teaching materials should make maximum use of numerical and graphical representation, written material being kept to a minimum;
    (b) where materials developed in one country are adapted for use in another, this adaptation should be carefully made with due regard to local factors.
67. Machines and equipment used in workshops in educational institutions should be geared to the level and training of the users. This equipment should be simple and designed especially for pedagogical purposes without however being obsolete or teaching obsolete procedures. Training using complex equipment may be given more appropriately and efficiently on the job.

*Evaluation*

68. Evaluation should be an integral part of the teaching and learning process in technical and vocational education, and its major function should be the development of the particular individual in accordance with his interests and capacities.
69. Although standards of performance should be upheld, evaluation of the student's work should be made on a total basis considering among others his class participation, his interest and attitude, his relative progress, allowance being made for his aptitudes, and examinations and other tests.
70. Students should participate in the evaluation of their own progress and the evaluation of student work should have a system of feedback built into it so that learning problems and their causes may be identified and steps taken to correct them.
71. Continuous evaluation of the teaching process should be made by both teachers and their supervisors, with the participation of students as well, in order to determine the effectiveness of the methods and materials used, and to devise alternatives should the need arise. Continuous evaluation of the teaching-learning process should be undertaken with the participation of representatives from the occupational fields concerned.

**IX. Staff**

72 To enhance the achievement of the objectives of technical and vocational education, a priority should be given to the recruitment and preparation of adequate numbers of well-qualified and competent teachers, administrators and guidance staff and to the provision of the

necessary training and other facilities to enable them to function effectively in their profession.

73. The emoluments and conditions of service which are offered should compare favourably with those enjoyed by persons with similar qualification and experience in other occupational sectors. In particular, promotions, salaries and pension scales for technical and vocational education staff should take into account any relevant experience acquired in employment outside the educational sector.

*Teaching staff*

74. All teachers in technical and vocational education, including those who teach only practice, should be considered an integral part of the teaching profession and as such should be recognized as having the same status as their colleagues in other fields. In this regard:
    (a) the Recommendation concerning the Status of Teachers adopted by the Special Intergovernmental Conference on the Status of Teachers on 5 October 1966 is applicable to them especially as regards the provisions concerning preparation for a profession and continuing education; employment and career; the rights and responsibilities of teachers; conditions for effective teaching and learning; teachers' salaries; social security;
    (b) arbitrary distinctions between teachers employed by various types of educational institutions, e.g. specialized technical and vocational institutions and general education institutions, should be eliminated.
75. Teachers involved in any aspect of technical and vocational education, whether on a full-time or part-time basis, should possess the personal, ethical, professional and teaching qualities essential for the accomplishment of their work.
76. Teachers of technical and vocational aspects in general education should:
    (a) be familiar with a broad range of specialities;
    (b) develop the ability to relate these to each other as well as to the larger social, economic and historical and cultural context;
    (c) where this aspect of technical and vocational education serves primarily an occupation or educational orientation function, be able to give guidance.
77. Considering technical and vocational education as preparation for an occupational field, teachers in this area should have special qualifications depending on the occupation for which they are preparing students:
    (a) if the occupational field requires primarily practical skills the teacher should himself have long employment experience in the exercise of these skills;
    (b) if students are to be prepared for technician or middle management positions, teachers should have a thorough knowledge, preferably acquired through appropriate practical experience, of the special requirements of this type of position;

(c) if the occupational field requires research and theoretical analysis, e.g. an engineering field, the teacher should have a university education and be actively engaged in research himself.

78. Considering technical and vocational education as continuing education, teachers in this area should, in addition to the special preparation for teaching adults, have an adequate knowledge of the working environment of their students and have specialized knowledge and skills in their teaching field.

79. Skilled professionals employed in appropriate sectors outside education should be invited to teach, at suitable points in technical and vocational education, certain programmes in schools, universities or other educational institutions in order to link the world of work more closely to the classroom.

80. Teachers of general subjects in institutions which offer technical and vocational education, in addition to the usual qualification, both professional and in their teaching field, should receive a special initiation concerning the objectives and requirements of technical and vocational education.

81. Preparation for technical and vocational teaching should be given as a tertiary programme, thereby requiring completion of secondary education or its equivalent for entrance. All types of programme should be designed with the following objectives in mind:
    (a) to maintain standards of education and professional preparation in vigour for the teaching profession as a whole and to contribute to the raising of these overall standards;
    (b) to develop in the future teacher the ability to teach both theoretical and the practical aspects of his field;
    (c) to ensure that the teacher will be qualified, with minimum further training, to teach other groups than those for which he was prepared initially.

82. Varied and flexible programmes, full time and part time, adapted to the special requirements of a wide variety of recruitment sources as well as to those of the field to be taught and the group or groups to be taught should be available.

83. In those cases where it is difficult for intending technical and vocational teachers to acquire employment experience, consideration should be given to creating units, attached to teacher-training institutions, for the production of equipment and teaching materials for the schools in which intending teaching staff would be required to work for varying lengths of time.

84. The professional preparation of all technical and vocational teachers should include the following elements:
    (a) educational theory both in general and as especially applying to technical and vocational education;
    (b) educational psychology and sociology as it especially applies to the group or groups for which the future teacher will be responsible;
    (c) special teaching methods appropriate to the field of technical and vocational education for which the future teacher is preparing and

the groups to be taught, in methods of evaluation of student work, and in classroom management;

(d) training in the choice and use of the whole range of modern teaching techniques and aids presupposing the use of up-to-date methods and materials in the programme of professional preparation itself;

(e) training in how to create and produce appropriate teaching materials, of special importance in those cases where technical and vocational materials are in short supply;

(f) a period of supervised practice teaching experience before appointment to a teaching post;

(g) an introduction to educational and occupational guidance methods as well as to educational administration;

(h) a thorough grounding in safety and emphasis on the ability to teach safe working practice and habitually to set a good working example.

85. Staff responsible for the preparation of technical and vocational teachers should have obtained the highest qualifications possible in their field:

(a) teacher-educators responsible for special technical and vocational fields should have qualifications in their field equivalent to those of special subjects staff in other institutions and programmes of higher education, including advanced degrees and employment experience in a related occupational fields;

(b) teacher-educators responsible for the pedagogical aspect of teacher preparation should themselves be experienced teachers in technical and vocational education and should possess the highest qualifications in a specialized field of education.

86. Staff responsible for the preparation of technical and vocational teachers should be actively engaged in research in their field and provision should be made for this in terms of a reasonable teaching load and access to appropriate facilities.

87. Teaching staff should be encouraged to continue their education, whatever the field in which they specialize, and should have the necessary means to do so. This continuing education which should be made available in a wide range of facilities, should include:

(a) periodic review and updating of knowledge and skills in the special field;

(b) periodic updating of professional skills and knowledge;

(c) periodic work in the occupational sector relating to the special field.

88. Account should be taken of a teacher's achievements in continuing education when the responsible authorities consider questions of promotion, seniority and status concerning him.

*Administrative and guidance staff*

89. Administrative responsibilities for technical and vocational education programmes should be entrusted to persons with the following qualifications:

(a) teaching experience in a field of technical and vocational education;

(b) proficiency acquired through study and employment experience in one of the fields taught in the programme;
(c) a broad vision of technical and vocational education as a whole and of the interrelation of the various aspects;
(d) a knowledge of administrative techniques.

90. The heads of establishments in technical and vocational education should receive adequate administrative assistance so that they can devote most of their time to the highly important educational and scientific aspects of their work. Technical and vocational education establishments should have sufficient staff to provide the following services:
(a) advice and guidance for candidates and students;
(b) the preparation, supervision and co-ordination of all practical work and experiments;
(c) the maintenance of instruments, apparatus and tools in workshops and laboratories.

91. Administrators should keep up to date with new administrative techniques and trends through programmes of continuing education. Prospective administrators should receive special training in methods and problems involved in the task. This preparation should include:
(a) management methods appropriate to educational administration;
(b) methods of allocation of available resources given the objectives of the various programmes for which they will be responsible;
(c) planning methods.

92. Guidance staff should receive special preparation for their tasks whether they are specialists or are teachers serving also as guidance staff. This preparation should be equipped to make objective assessments of aptitude, interest and motivation and to have at hand up-to-date information concerning career and education opportunities. During this preparation they should acquire a direct knowledge of the economy and the world of work through systematically organized visits to enterprises and periods of time spent in enterprises. Guidance staff should be required and provided with facilities—including the opportunity for practical experience—to keep up with new methods of guidance and information as to new or changed educational training and employment opportunities.

## X. International co-operation

93. Member States should give priority to international co-operation in the field of technical and vocational education.
(a) This co-operation, whether in the framework of bilateral or multilateral agreements, or through international organizations, should be directed to improving the quality of technical and vocational education and developing and expanding it where necessary.
(b) Every effort should be made to co-ordinate within any given country the international assistance activities in the field of technical and vocational education.

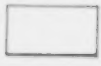
94. Member States should take special measures to provide foreigners (in particular migrants and refugees) and their children living within their territory with technical and vocational education. Such measures should take into account the special needs of such persons in the host country as well as in view of their possible return to their country.
95. Provision should be made at national, regional and international levels for the regular exchange of information, documentation, and materials of international interest obtained from research and development efforts on all levels concerning technical and vocational education, in particular:
    (a) publications concerning, among others, comparative education, psychological and pedagogical problems affecting general and technical and vocational education, and current trends;
    (b) information and documentation concerning curriculum development, methods and materials, study opportunities abroad, employment opportunities including manpower requirements, working conditions and social benefits;
    (c) teaching materials and social benefits;
    (d) mass media programmes of an informational or pedagogical character.
96. Regional co-operation among countries having a common cultural heritage and facing common problems in the development or extension of technical and vocational education should be highly encouraged through:
    (a) periodic meetings on the ministerial level and the establishment of a standing committee or organization to review policies formulated and actions taken;
    (b) the creation of joint facilities for higher level research, the development of prototype materials and equipment, and the preparation of staff for the training of teachers where the costs of such facilities are too high to be sustained by any one country in a given region.
97. The development of both written and audio-visual teaching and learning materials which are suitable for international or regional use should be considered a priority area in international co-operation. These materials should contribute to the progressive establishment of common standards for professional qualifications acquired through technical and vocational education.
98. Member States should encourage the creation of a climate of opinion favourable to international co-operation in the field of technical and vocational education through:
    (a) teacher and student fellowships and exchanges;
    (b) establishment of sustained contacts between similar institutions in different countries;
    (c) provision of employment experience abroad, particularly when opportunities at home are limited.
99. To facilitate international co-operation, Member States should apply within technical and vocational education internationally recommended standards and norms relating in particular to:
    (a) system of measure;

(b) scientific and technical symbols;
(c) occupational qualifications;
(d) information processing;
(e) equivalencies of qualifications acquired through technical and vocational education implying standardization of curricula and testing, including aptitude tests, for some technical fields;
(f) safety and security through testing of materials and products.

100. Internationally recommended standards and norms concerning technical and vocational education should be continuously evaluated through sustained research concerning the effectiveness of their application in the various countries especially in order to facilitate the establishment of equivalence of qualifications and free movement of individuals between the different national systems of education.

# II. The technical and vocational education systems in diagram form

## Key


Separate categories of institutions within the educational system

Presence of technical and vocational subjects within the general education curriculum

Comprehensive institutions

Institutions exclusively for technical and vocational education

Institutions for technical and vocational education outside the formal education system


Normal routes through the system


Second or unusual routes through the system

Examinations required to obtain recognition of successful completion of one level of education before proceeding to the next level

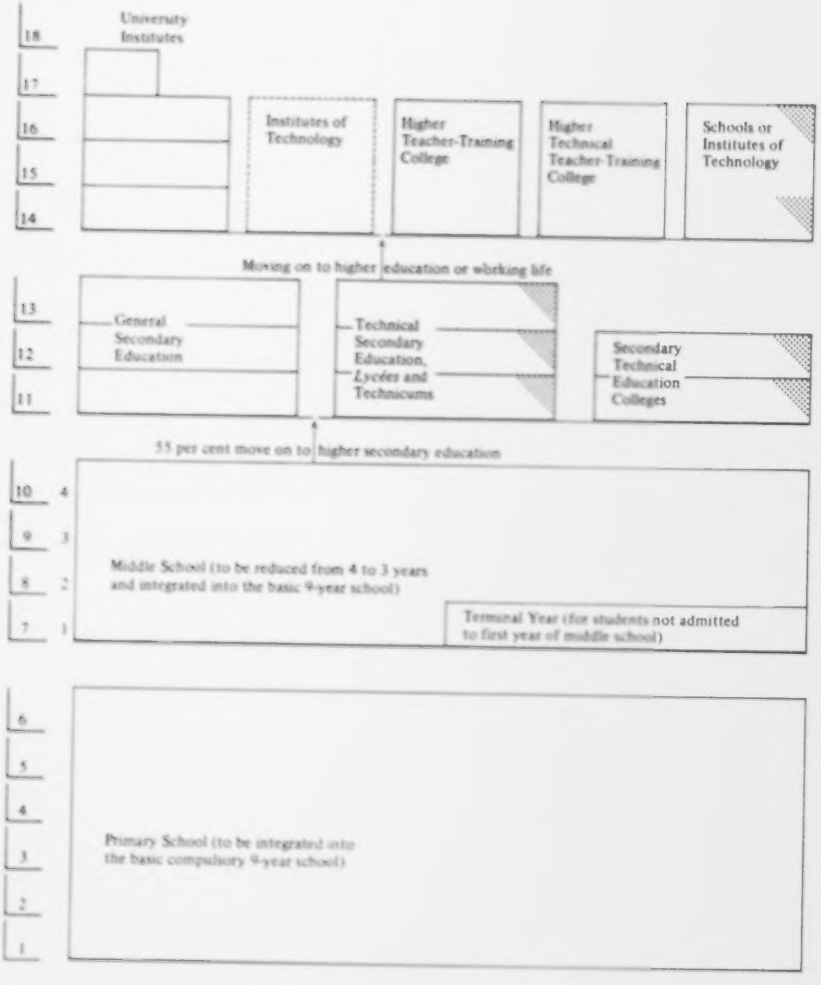
Engineering qualification, professional

Skilled worker or craftsman qualification

Technician qualification, subprofessional

T Technical teacher qualification

# Algeria (1981)



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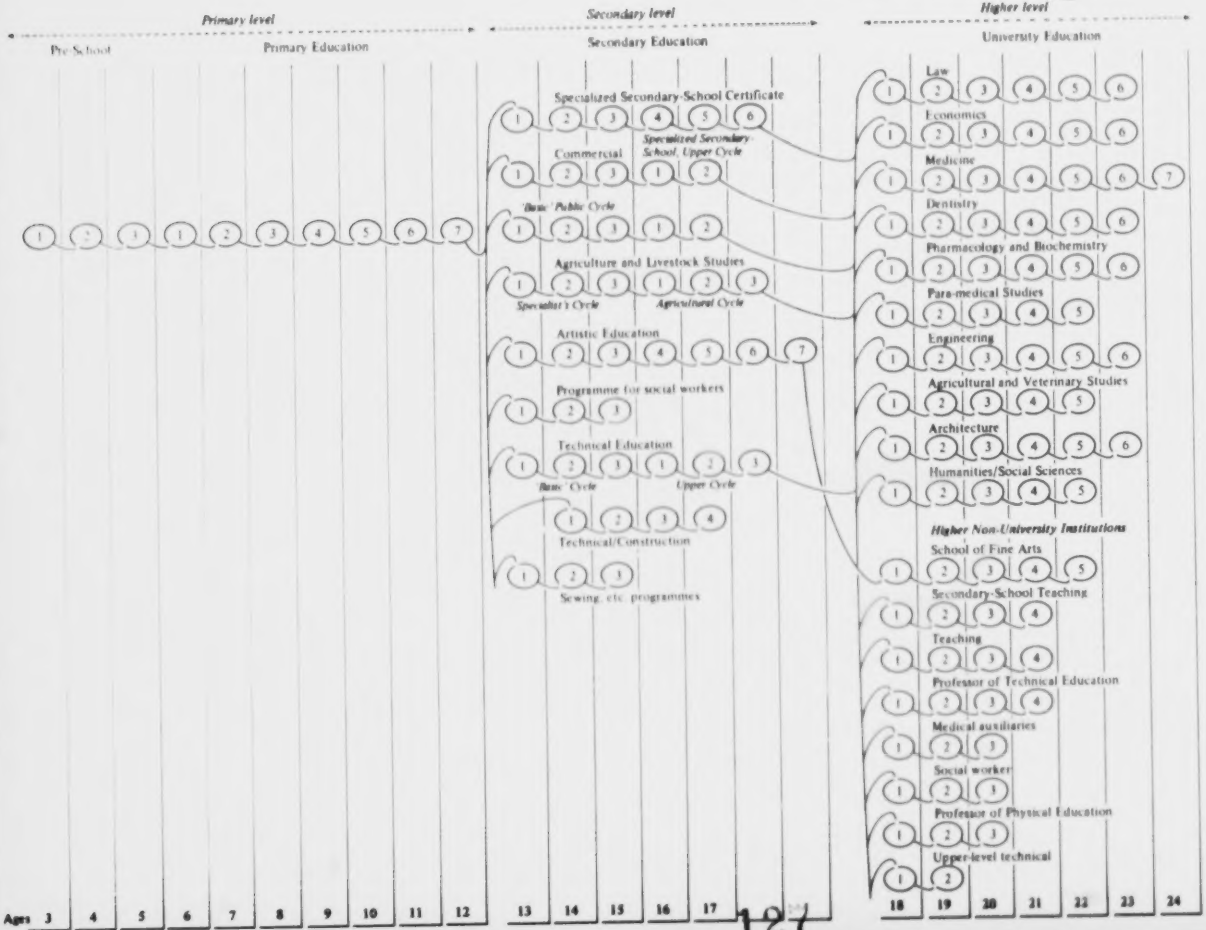
# Argentina (1979)



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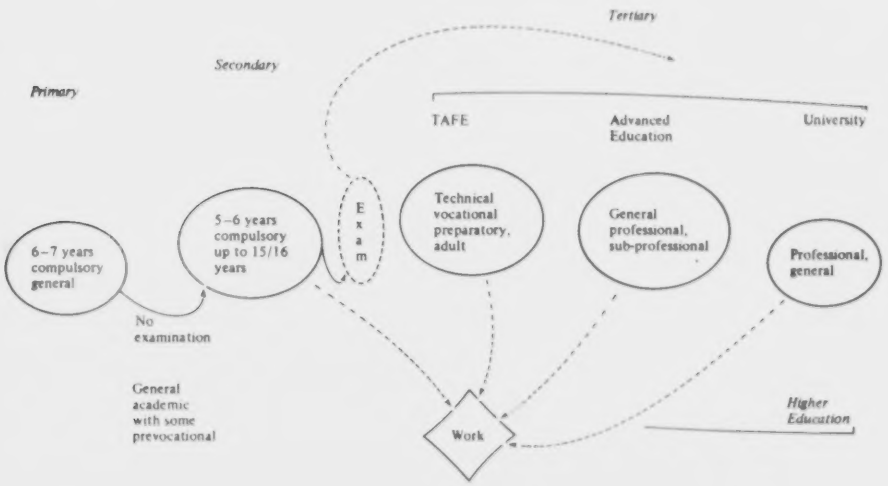
# Australia

In Australia the responsibility for education is divided between government at state level and government at national level. Systems of education vary from state to state, and so there is no one model. However, the diagram below illustrates the South Australian model, to which most Australian states approximate.




The national government co-ordinates higher education, which it fully funds, and provides some funds for schools and technical and further education (TAFE) colleges. Schools and TAFE colleges are co-ordinated by state governments, which provide the bulk of funds. The term 'tertiary education' encompasses TAFE, colleges of advanced education and universities; 'higher education' refers only to the latter two types of institution.

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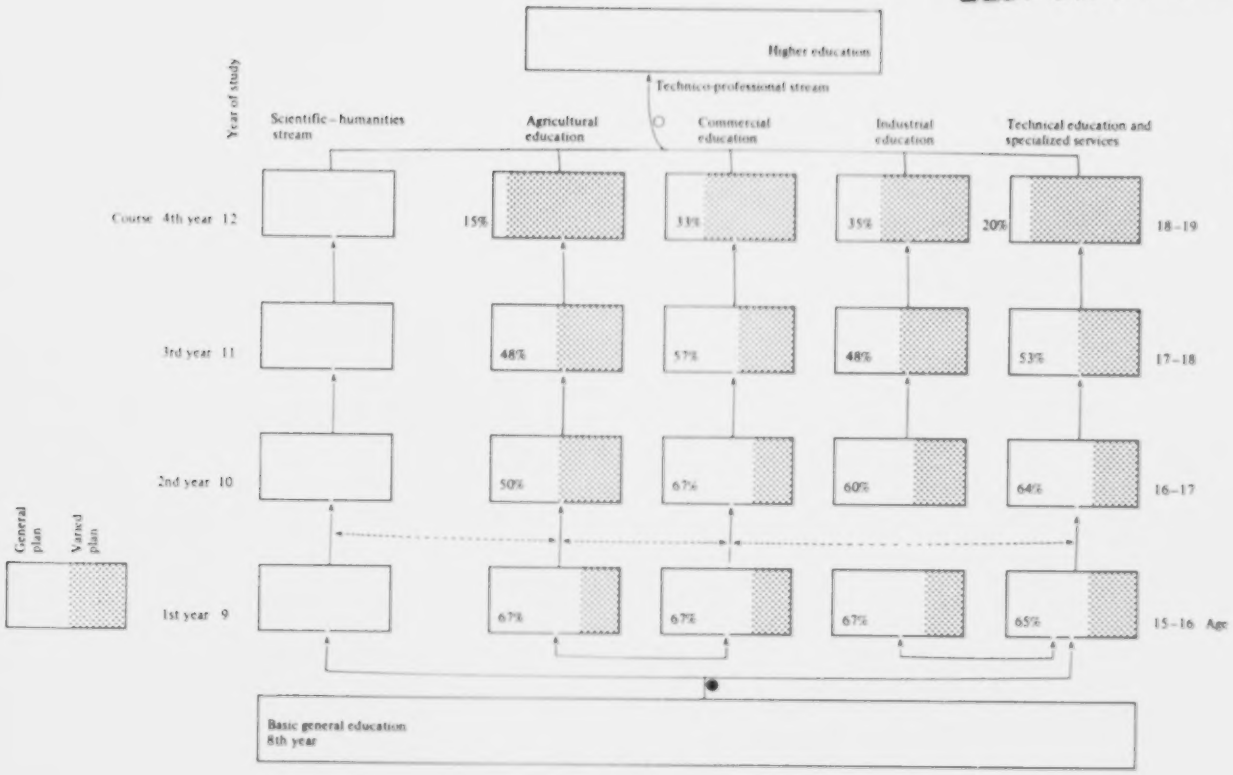
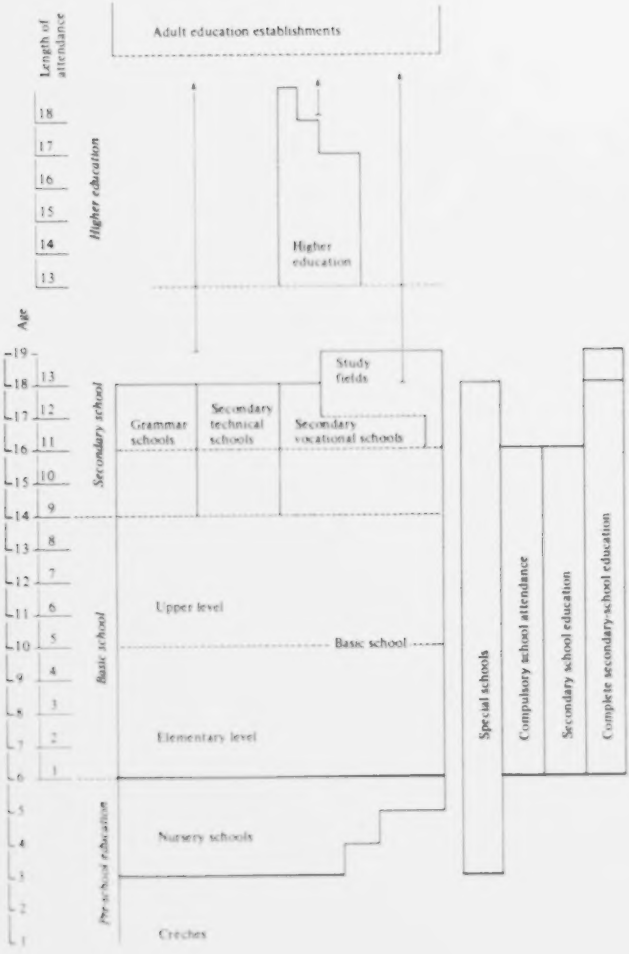
## Chile




*Source*: G. Del Campo. ***Analisis y Tendencias de la Educación Técnica y la Formación Profesional en Chile***, p. 65. **Buenos Aires, Instituto Nacional Superior del Profesorado Técnico, 1971.**

# Czechoslovakia

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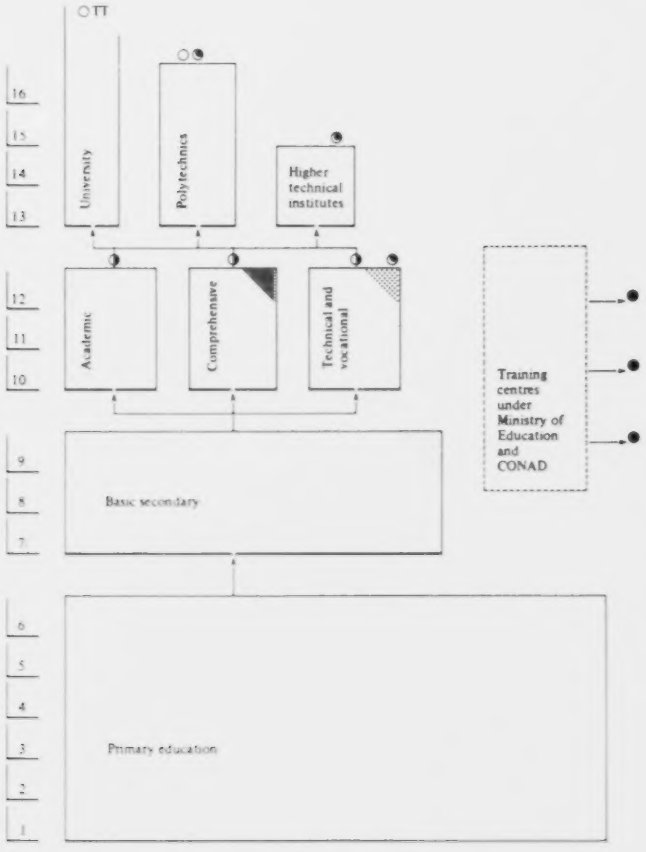
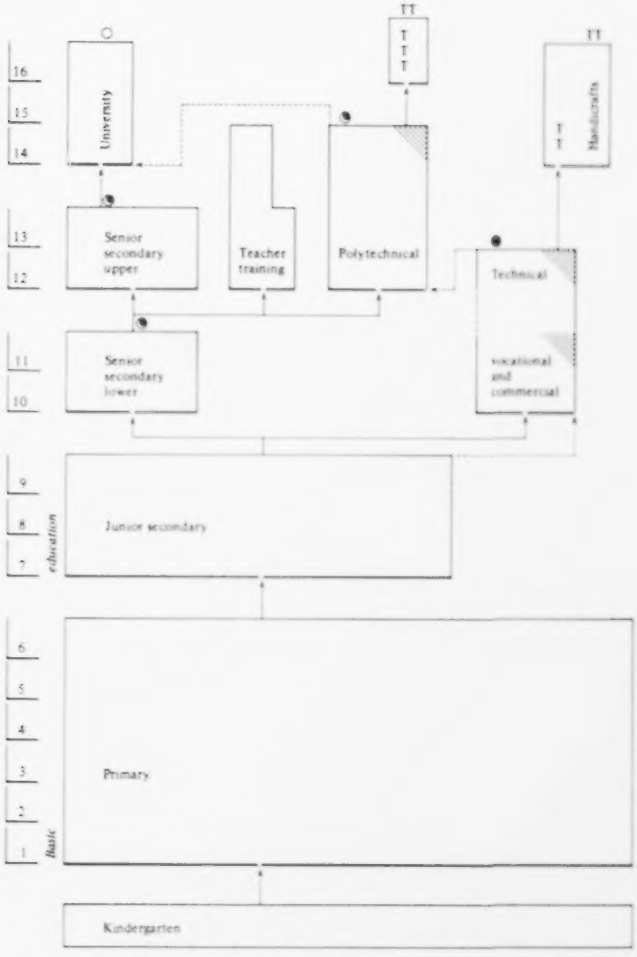
# Ecuador

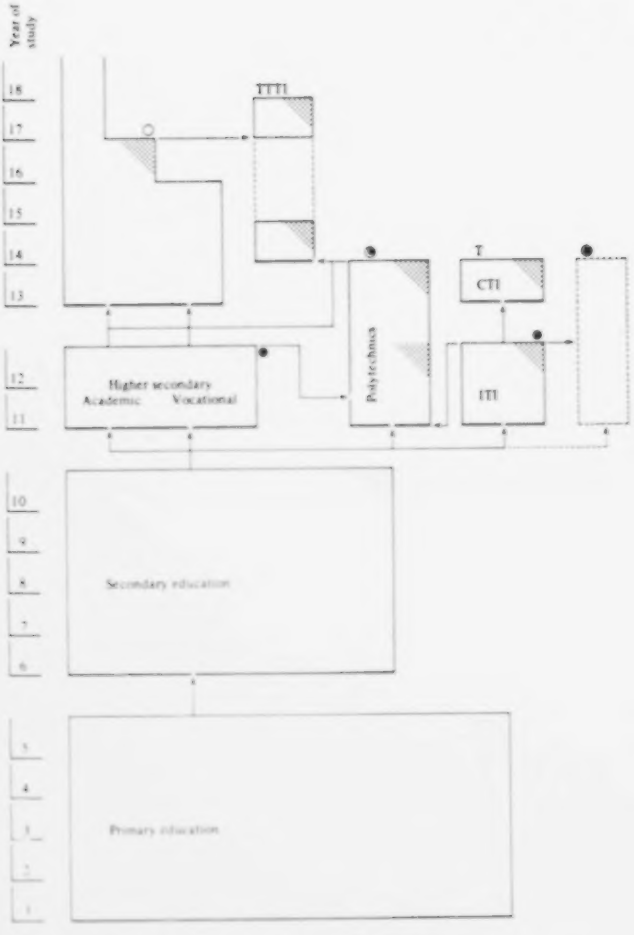

TT
16
15
14
13
University
Polytechnics
Higher technical institutes
12
11
10
Academic
Comprehensive
Technical and vocational
Training centres under Ministry of Education and CONAD
9
8
7
Basic secondary
6
5
4
3
2
1
Primary education

T
III
Gambia College
Technical institute and vocational training centre
In-village training under CDA supervision
C&RDTC
SCHN
Selected projects in business under IBAS
Settlement project
13
11
II
10
9
8
7
High school
Secondary technical school
AVTC
GOIC
RVTP
6
I
5
4
3
2
1
Primary schools
Action aid

# Ghana

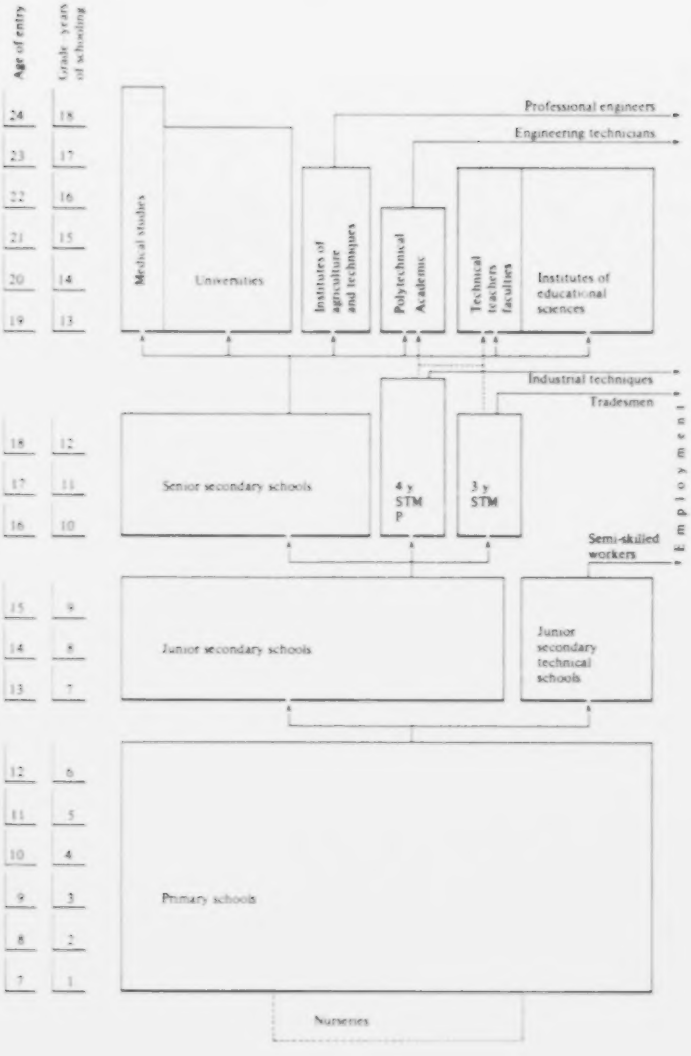

16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Basic education
University
Senior secondary upper
Teacher training
Polytechnical
Technical
vocational and commercial
Senior secondary lower
Junior secondary
Primary
Kindergarten
Manufacturing

# India

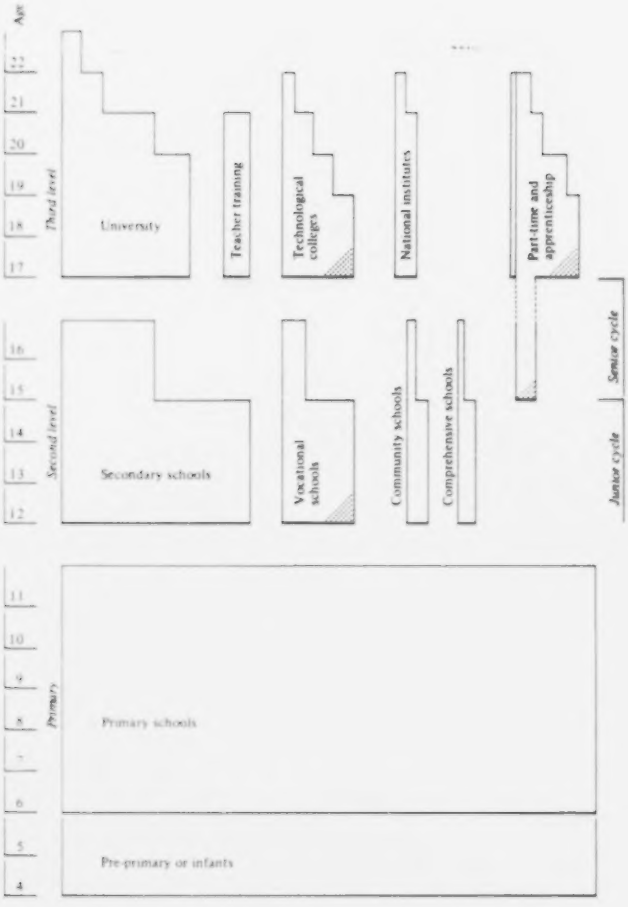



TTTI: Technical Teachers' Training Institute
ITI: Industrial Training Institutes
CTI: Central Training Institute

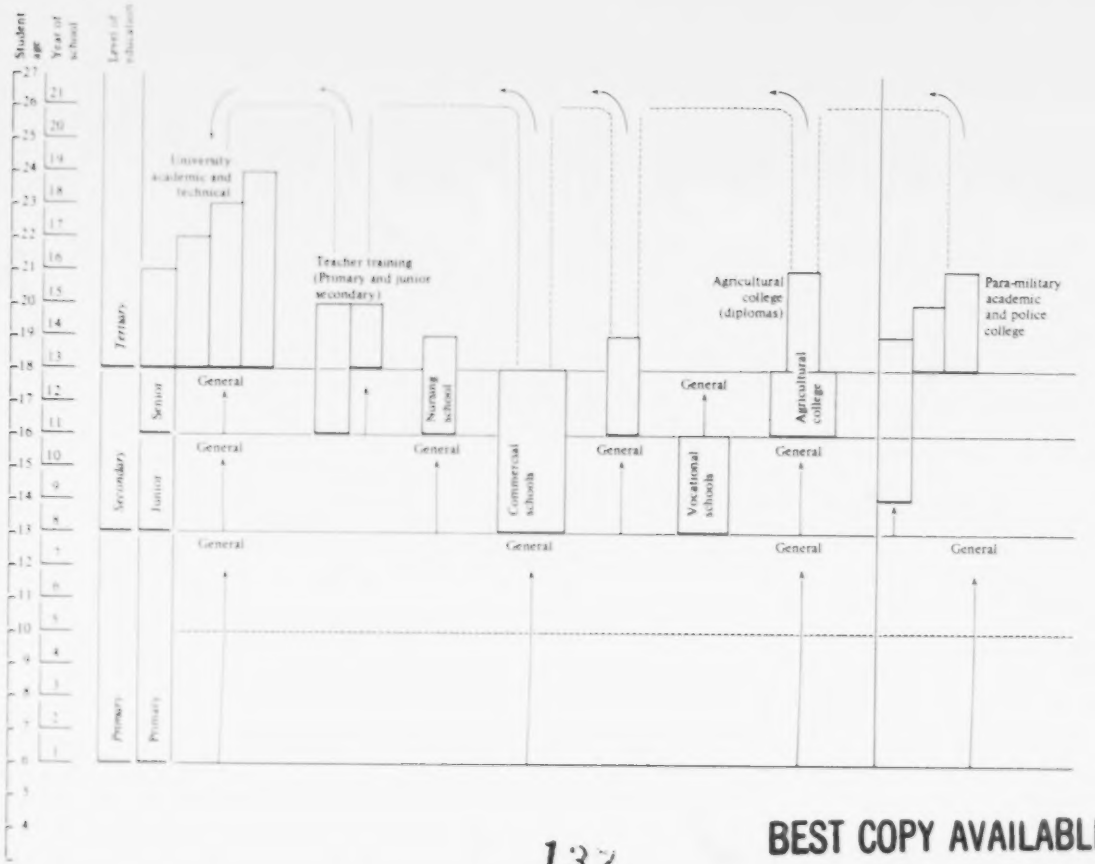
# Indonesia


Age of entry
Grade years of schooling
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
18
17
16
15
14
13
12
11
10
9
8
7
Medical studies
Universities
Institutes of agriculture and techniques
Polytechnical Academic
Technical teachers faculties
Institutes of educational sciences
Professional engineers
Engineering technicians
Industrial techniques
Tradesmen
Senior secondary schools
4 y STM P
3 y STM
Semi-skilled workers
Junior secondary schools
Junior secondary technical schools
Primary schools
Nurseries
Employment

# Ireland


Age
22
21
20
19
18
17
Third level
University
Teacher training
Technological colleges
National institutes
Part-time and apprenticeship
16
15
14
13
12
Second level
Secondary schools
Vocational schools
Community schools
Comprehensive schools
Senior cycle
Junior cycle
11
10
9
8
7
6
5
4
Primary
Primary schools
Pre-primary or infants

# Lesotho



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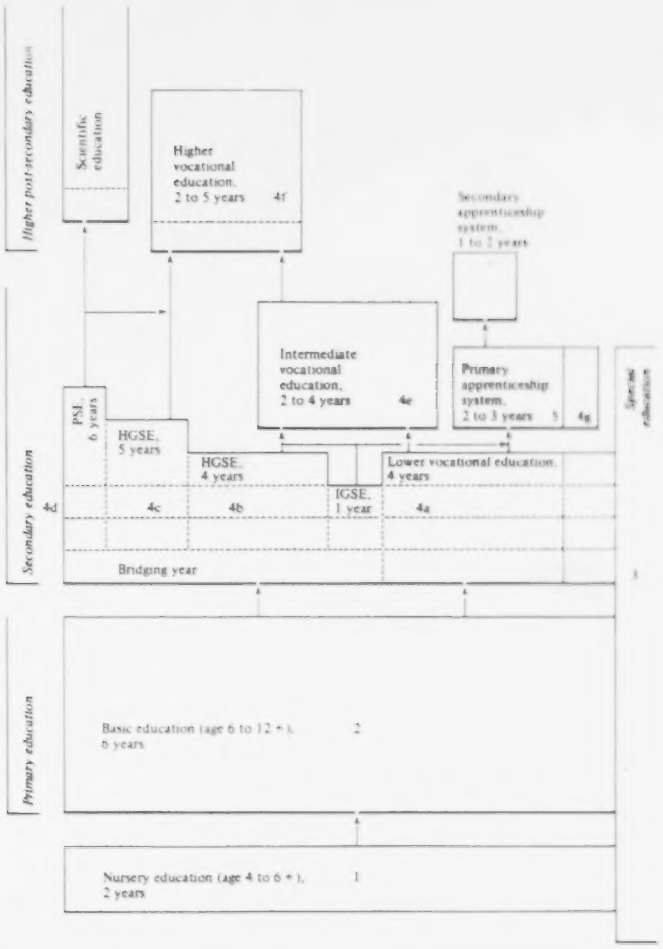
# Netherlands

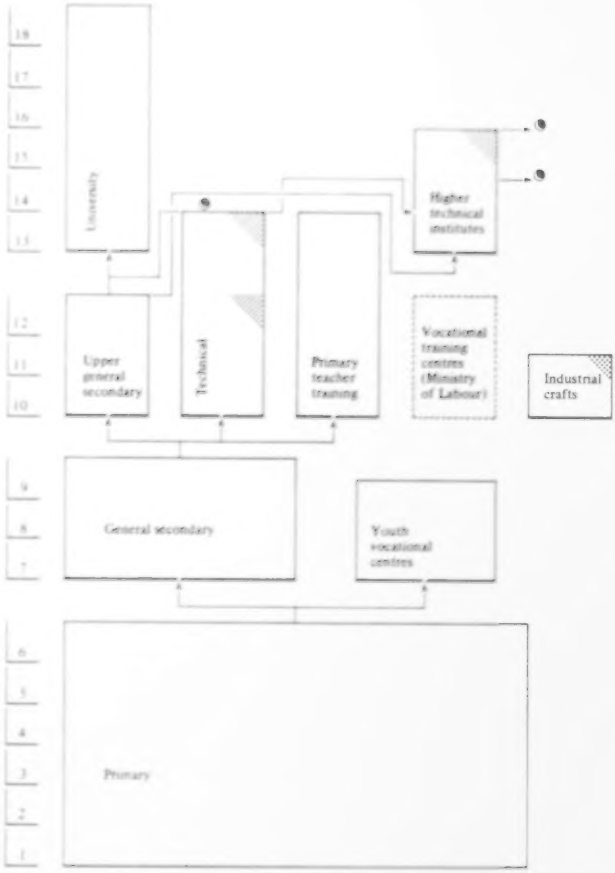

Higher post-secondary education
Scientific education
Higher vocational education, 2 to 5 years 4f
Secondary apprenticeship system, 1 to 2 years
Intermediate vocational education, 2 to 4 years 4e
Primary apprenticeship system, 2 to 3 years 5 4g
Special education
PSI, 6 years
HGSE, 5 years
HGSE, 4 years
IGSE, 1 year
Lower vocational education, 4 years
Secondary education
4d
4c
4b
4a
Bridging year
3
Primary education
Basic education (age 6 to 12 +), 6 years 2
Nursery education (age 4 to 6 +), 2 years 1

IGSE: Intermediate general secondary education
HGSE: Higher general secondary education
PSE: Preparatory scientific education
Types 4a, 4e, 4f, 4g and 5 together form vocational education and are the subject of this study; 4g = educational courses for early school-leavers.

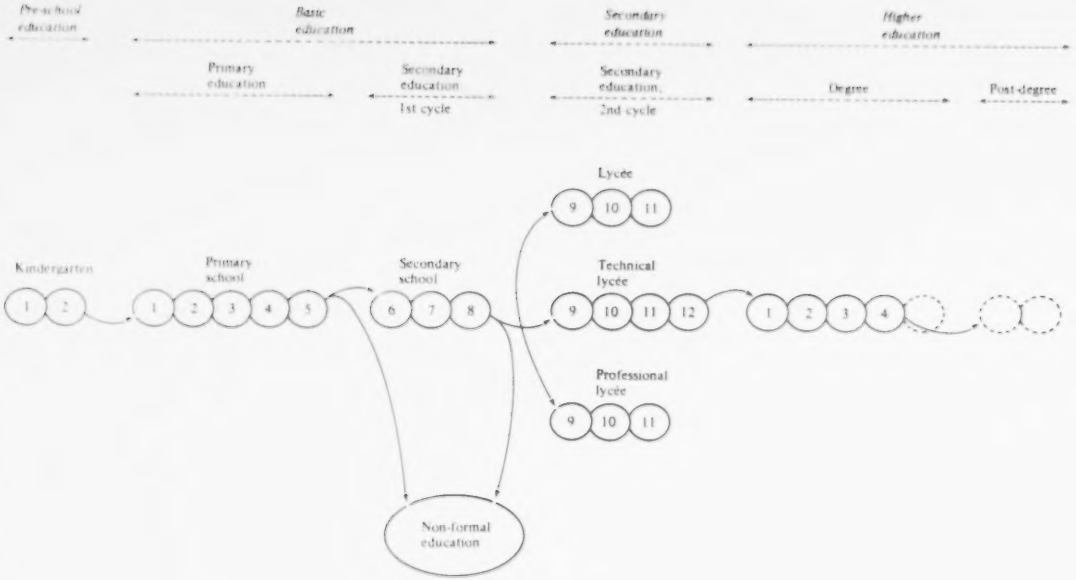
## Sri Lanka


Universities
Technical education
Vocational education and training
Apprenticeship
In-service training
Open universities
LK
1
2
3
4
5
6
7
8
9
10
GCE O/L
11
12
GCE A/L
Professional institutes
Primary
Junior secondary
Senior secondary

# Sudan


18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
University
Higher technical institutes
Upper general secondary
Technical
Primary teacher training
Vocational training centres (Ministry of Labour)
Industrial crafts
General secondary
Youth vocational centres
Primary

# Turkey



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# III. Guidelines for country reports

The following guidelines, along with the Unesco Revised Recommendation concerning Technical and Vocational Education, were used in drawing up the country reports and case-studies. These guidelines were designed in order that that the resulting reports provide information on individual countries, but permit also analysis as a whole within the international framework provided by the Revised Recommendation. The formulation and presentation of the reports/case-studies within a common framework was intended to facilitate discussions and provide background material and information for experts, facilitate the exchange of information and experiences between Member States in the field of technical and vocational education, and suggest more effective means for implementing the Revised Recommendation.

**Part I. Technical and vocational education profile**

1. *Structures* (see Unesco Revised Recommendation concerning Technical and Vocational Education, paras. 1–2, 9–17).

Briefly describe and illustrate graphically:

1.1 The structure of the education system as a whole and the place of technical and vocational education including teacher training within it, indicating the articulation between stages of schooling and between school and work, and where possible, the relationship between in-school and out-of-school programmes.

1.2 The organizational structures, showing relationships and linkage among them, for:

1.2.1 overall policy-making and planning for technical and vocational education;

1.2.2 research and development; and the collection and dissemination of information (if possible annex to your report the names of such institutions);

1.2.3 co-ordinating in-school and out-of-school programmes and co-ordinating technical and vocational education with manpower planning and employment;

1.2.4 the administration, including supervisory services.

1.3 The legislative instruments that exist for the implementation of the technical and vocational education policy in general and particularly for:

1.3.1 establishing norms for the structural and qualitative improvement of technical and vocational education;

1.3.2 establishing norms for the:

access to technical and vocational education,

articulation with other forms of education,

overall supervision on the national basis of the implementation procedures of the overall policy of technical and vocational education,

qualifications and equivalencies for recognition of educational and professional achievements for further education and employment so as to remove any discrimination in education,

qualifications and experiences of teaching staff,

ratio of teaching and training staff to learners,

safety procedures for all learning environments—classrooms, laboratories and workshops,

evaluation, supervisory and accreditation services within the administrative structures.

1.4 Briefly describe the problems that the implementation of the technical and vocational education policy has/is facing, including:

1.4.1 financing for facilities, equipment, consumable materials ... etc.;

1.4.2 staffing and teacher training both pre- and in-service;

1.4.3 enrolment and entrance qualifications to the various types of institutions;

1.4.4 certification and access to higher education;

1.4.5 co-operation with the economic establishments.

2. *Financing* (see Revised Recommendation, paras. 10(c) and 18)

Describe how technical and vocational education is financed, including:

2.1 The public, parastatal or private agencies that have financial responsibilities in technical and vocational education:
  2.1.1 recent capital expenditures by these agencies in establishing new technical and vocational education institutions or programmes;
  2.1.2 recent recurrent expenditures by these agencies on running technical and vocational education institutions or programmes;
  2.1.3 share of capital and recurrent expenditures for technical and vocational education in the government's total education budget.

2.2 Support from external aid.

2.3 Unit costs including:
  2.3.1 capital costs per students-place in existing technical and vocational education institutions;
  2.3.2 recurrent costs per student in existing technical and vocational education institutions;
  2.3.3 comparison of capital and recurrent costs per student in technical and vocational education with capital and recurrent costs of other forms of education and training.

2.4 Breakdown of costs including:
  2.4.1 main elements of capital costs as between construction, furniture and equipment;
  2.4.2 main elements of recurrent costs as between salaries of teaching staff, salaries of non-teaching staff, costs of consumable materials and supplies, costs of electricity, gas and water, costs of maintenance of buildings and equipment, and other costs;
  2.4.3 if schools produce goods for sale, how does this income contribute to offsetting the recurrent costs?

2.5 Indicate if a cost-benefits analysis of technical and vocational education exists in your country and, if so, how do the returns compare to those of other types of education. Please compare these returns in the light of employment and non-employment of both the general and technical education systems' graduates.

3. *Technical and vocational aspects of general education* (see Revised Recommendation, paras. 19–23)

In your description please consider the following:

3.1 Major objectives.

3.2 Characteristics of the target group: age-groups and grade levels which have access to courses of general technical and vocational studies as part of the general education programme, including if possible statistics showing (a) the percentage of the total school population in these groups and grades now having access to such studies, and (b) the ratio of males to females in the courses.

3.3 General characteristics of programmes, indicating for example the relative emphasis on theory and practice, on educational or occupational guidance; the differences, if any, between programmes offered in urban and rural areas or to males and females.

4. *Technical and vocational education as preparation for an occupational field* (see Revised Recommendation, paras. 24–44)

Please consider the following:

4.1 Major objectives.

4.2 Characteristics of the target group, providing a statistical picture of such items as:

- 4.2.1 the percentage of the total 15–22-year-old group enrolled in technical and vocational education;
- 4.2.2 enrolment in technical and vocational education programmes as a percentage of the total enrolment of this age-group in educational institutions;
- 4.2.3 the proportion of males to females enrolled in technical and vocational education programmes;
- 4.2.4 the proportion of those enrolled in full-time programmes to those in part-time programmes;
- 4.2.5 enrolment in each of the following branches as a percentage of total enrolment in technical and vocational education: industrial, agricultural, commercial, services, other (please specify);
- 4.2.6 the percentage of unemployed in this age-group among those having completed secondary education and not admitted to higher education;
- 4.2.7 the percentage of unemployed among those having completed secondary or post-secondary technical and vocational education programmes.
- 4.2.8 provisions in the system for women and disadvantaged groups.

4.3 Organization:

- 4.3.1 types of institutions on both secondary and tertiary levels offering full-time programmes;
- 4.3.2 types of part-time programmes;
- 4.3.3 modes of participation of or collaboration with the various employment sectors, public and private, and public agencies responsible for training programmes outside the education system;

4.4 General characteristics of programmes, including the occupational areas now emphasized and the extent to which programmes lead to job qualification according to nationwide standards and how these standards are maintained.

4.5 Has the pattern of manpower demand changed, in the light of the rapid technological development, for the higher-qualification graduates as against the lower ones, e.g. technicians against skilled workers, in your country. Please comment on how the technical and vocational education institutions are meeting such demands and what impact they have on the overall improvement of the economic productivity of the country.

4.6 If possible, give examples and compare age-earning profiles, drawn from projected cross-section data, which would reflect the future supply and demand of general and technical/vocational education graduates. Indicate how this affects your country's educational priorities.

5. *Technical and vocational education as continuing education* (see Revised Recommendation, paras. 45–53)

Please describe:

5.1 The facilities available for continuing education in educational institutions, at places of work or through other means of organization.

5.2 Characteristics of the target group (age, professional levels, occupational fields, etc.).

5.3 The types of programme offered and means of recognition of achievement.

5.4 Measures taken to encourage continuing education while in employment in terms of job promotion, publicity, time off, etc.

6. *Guidance* (see Revised Recommendation, paras. 54–62)

Outline the general characteristics of the guidance services available within technical and vocational education, including especially information with regard to evaluation and follow-up procedures of these services.

7. *The teaching and learning processes: methods and materials* (see Revised Recommendation, paras. 63–71)

Indicate the general pedagogical principles underlying teaching and learning in technical and vocational education, illustrated by particular reference to significant characteristics of materials and equipment used, emphasis on practical work, evaluation of the teaching and learning process.

8. *Staff* (see Revised Recommendation, paras. 72–92)

Give a succinct picture of the recruitment, training and qualifications required of teachers in the programmes covered in items 3, 4 and 5 above.

**Part II. Dynamics of the development process**

1. *Major problems*

Analyse the major problems faced by your country in developing technical and vocational education, for example:

1.1 On the 'macro' level of overall national policy:

1.1.1 inequalities between technical and vocational education and general education and between rural and urban education which impede the democratization of education as a whole;

1.1.2 obstacles to overall reform of education which in consequence hinder the development of technical and vocational education, such as the selection and examination process, restriction of education to traditional institutions, overemphasis on traditional academic areas in education, etc.;

1.1.3 maladjustment between education and employment as reflected in a lack of correspondence between economic development needs and the training and education provided within the education system, and in a high rate of youth unemployment.

1.1.4 imbalance between supply and demand of the various categories of educated manpower.

1.2 On the 'micro' level within technical and vocational education:

1.2.1 lack of provision for general technical and vocational studies within the general education curriculum;

1.2.2 lack of proper provision of general education and development of social attitudes in technical and vocational education curricula;

1.2.3 inadequacy of upper and post-secondary programmes for the preparation of technicians;

1.2.4 ineffective teaching and learning methods and materials;

1.2.5 difficulties in recruiting and training qualified teachers;

1.2.6 lack of documentation and information services for technical and vocational education.

2. *The process of innovation and experiment*

In what problem areas identified in your reply to item 1 above, is your country undertaking (or has undertaken) experiment and innovation to develop solutions? Briefly describe the experiments, including:

2.1 The process for deciding on priority areas and for initiating experiment and innovation.

2.2 The role of research in identifying the specific problems to be dealt with and in formulating projects undertaken on an experimental basis.

2.3 The obstacles encountered in the course of the experiments and how these were overcome.

2.4 How results were evaluated.

3. *Policy and implementation*

Describe the process in your country for incorporating the successful results of experimentation into general policy, and indicate how this policy is, or will be, implemented.

**Part III. International co-operation** (see Revised Recommendation, paras. 93–100)

1. Indicate the ways in which your country now participates in international co-operation for the development of technical and vocational education and how these activities are co-ordinated. Please consider bilateral agreements and those through international organizations.

2. What provisions exist in your country to facilitate, at the national, regional and international levels, a regular exchange of information, documentation and materials of international interest obtained from

research and development efforts on all levels concerning technical and vocational education?

3. How do you foresee the participation of regional and international organizations and institutions in the development process of technical and vocational education? Please enumerate in order of priority the areas where such participation would be most desired and in what form.

# IV. Authors of reports

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This comparative study sets out the current situation of policy, planning and management of technical and vocational education in sixteen countries covering all the geographical regions of Unesco Member States.

It is based on case-studies prepared in 1982 by those countries according to specific guidelines in accordance with the activities foreseen in the Unesco Programme for 1981–83. The studies were also used as background documents in an International Experts Meeting held in Unesco Headquarters, Paris, in June 1982. The information provided on the present situation in those countries has also incorporated ongoing and anticipated reforms and innovations in technical and vocational education.

This study is addressed to teacher-educators, administrators and planners in particular and all others interested in technical and vocational education in general.

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